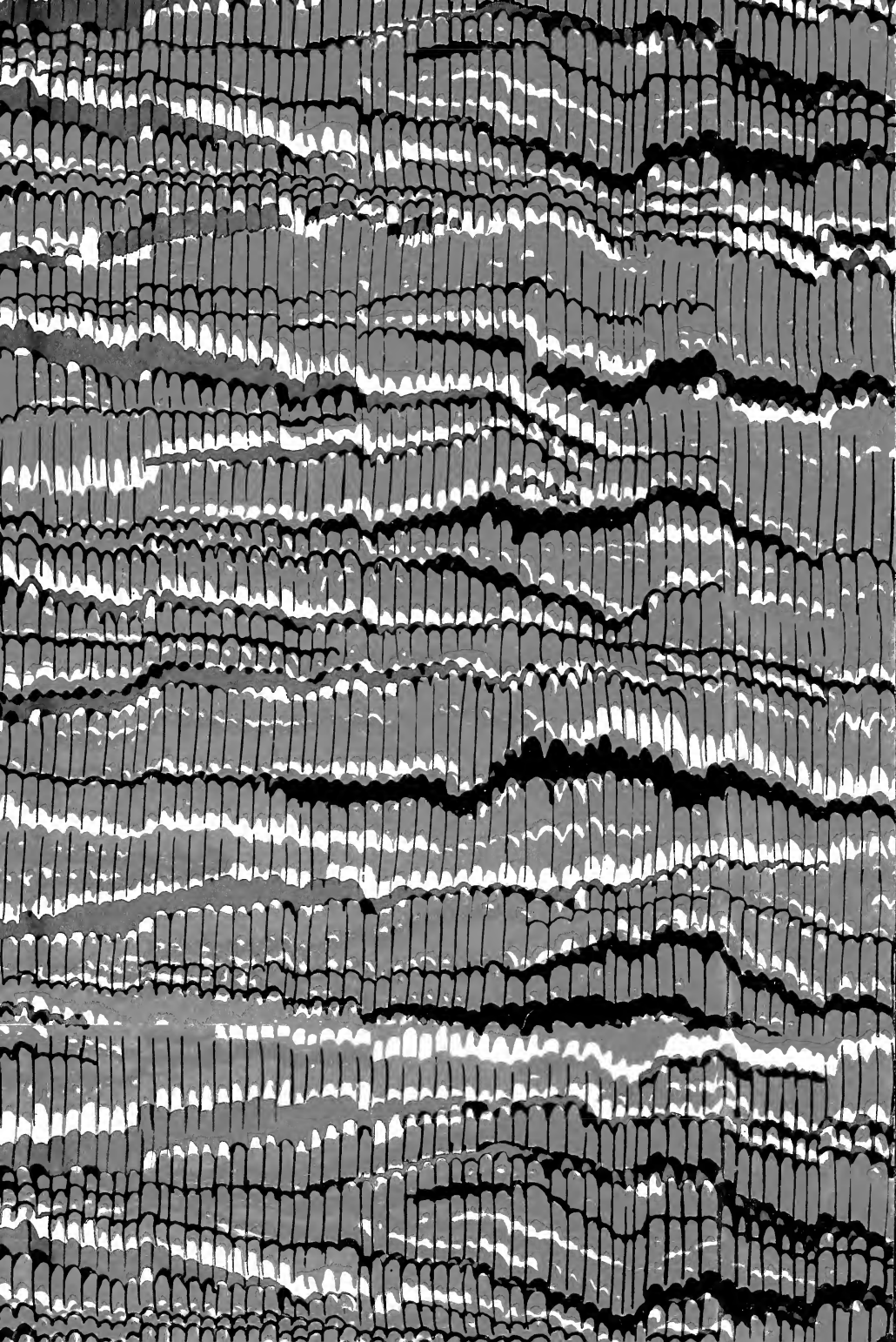

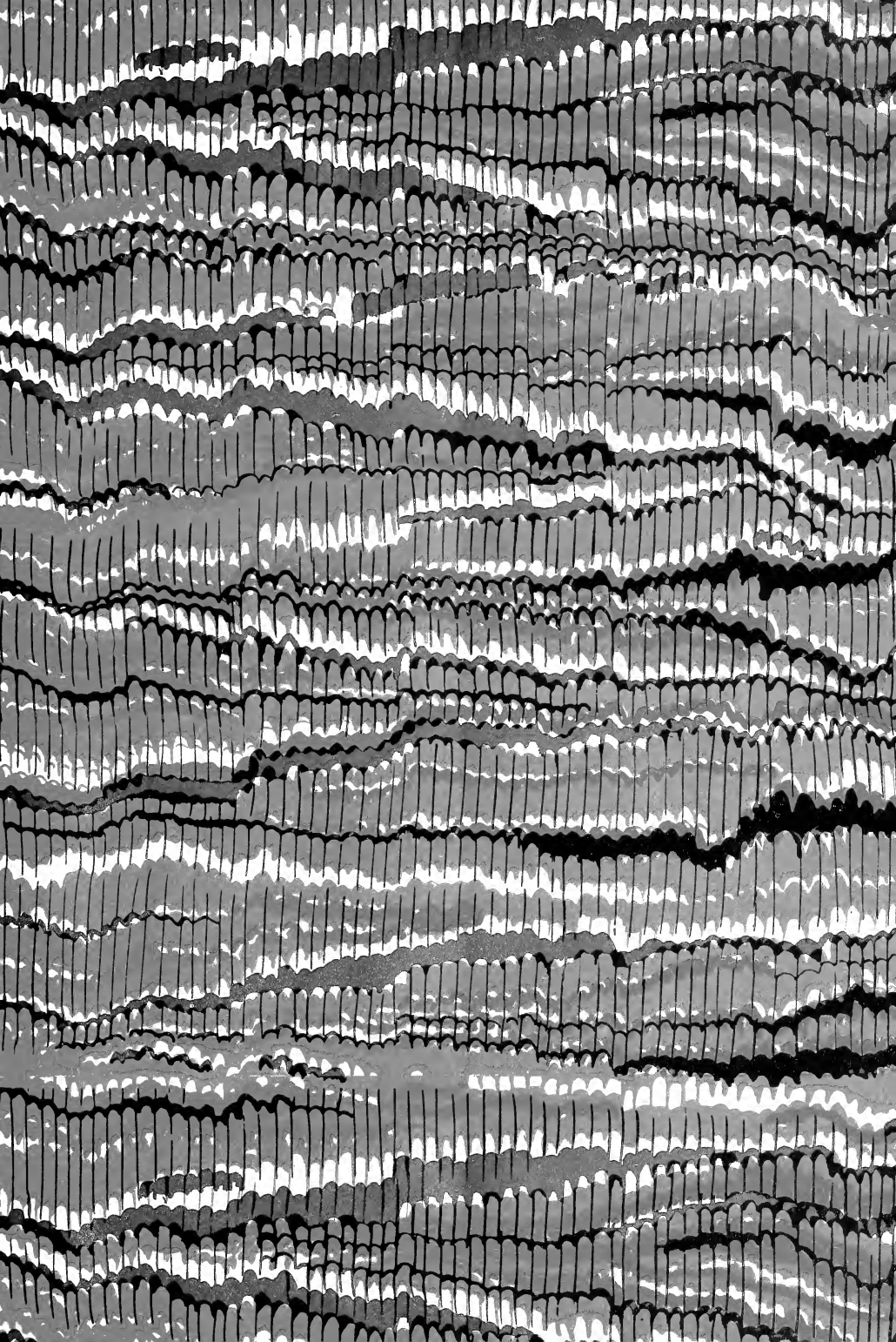

The Journal
OF THE
EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY

EDITED BY
Dr. V. G. L. van SOMEREN

Parts 1—3.

Containing 25 half-tone plates, 1 text figure, 1 diagram, 3 line-drawings, and 2 graphs.

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Vol. VI.

Nos. 1—3.

CONTENTS OF VOLUME VI.

No. 1.

No. 2.

No. 3.

ERRATA.

Vol. VI.

No. 1.

Page 20, line 11. For "Right" read "night."
Page 28, line 41. For "encendon" read "encedon."
Page 28, line 42. For "Popilio" read "Papilio."
Page 28, plate I. Fig 5, for "limniace" read "Liminiace."
Page 35, line 27. For "Hypolimnus" read "Hypolimnas."
Page 42, line 6. For "oochreus" read "ochreous."

No. 2.

Page 47, line 42. For "variationss" read "variations."
Page 52, line 1. For "sequivalent" read "equivalent."
Page 57, line 23. For "calcarcous" read "calcareous."
Page 57, line 41. For "priods" read "periods."
Page 57, line 43. For "ancstors" read "ancestors."
Page 62, line 31. For "rgion" read "region."
Page 65, line 21. For "destsroys" read "destroys."
Page 65, line 31. For "flycatchehs" read "flycatchers."
Page 66, line 13. For "netropical" read "neotropical."

No. 3.

Page 95, line 28. For "strekas" read "streaks."
Page 100, line 29. For "trnsversely" read "transversely."
Page 111, line 39. For "mairessi" read "mairessei."
Page 112, line 20. For "alcippona" read "alcippina."
Page 112, line 37. For "aurivilii" read "aurivillii."
Page 113, Pl. 1, fig. 10. For "acrae" read "acraea."
Page 113, line 35. For "pand" read "band."
Page 114, line 23. For "parhassia" read "parrhassia."
Page 116, line 28. For "transvrse" read "transverse."
Page 116, line 33. For "yelowish" read "yellowish."
Page 116, line 34. For "uderside" read "underside."
Page 120, line 35. For "sux" read "six."
Page 124, Pl. IV, fig. 2, 10. For "acrae" read "acraea."
Page 131, line 20. For "affra" read "caffra."
Page 131, line 29. Between "brownish-grey" and "in," insert "as."

LIST OF PLATES.

Vol. VI.

No. 1.

No. 3.

INDEX TO ILLUSTRATIONS.

GENERAL INDEX.

The Journal of the East Africa and Uganda. NATURAL HISTORY SOCIETY.

MARCH, 1925. *No. 21.*

Contents:

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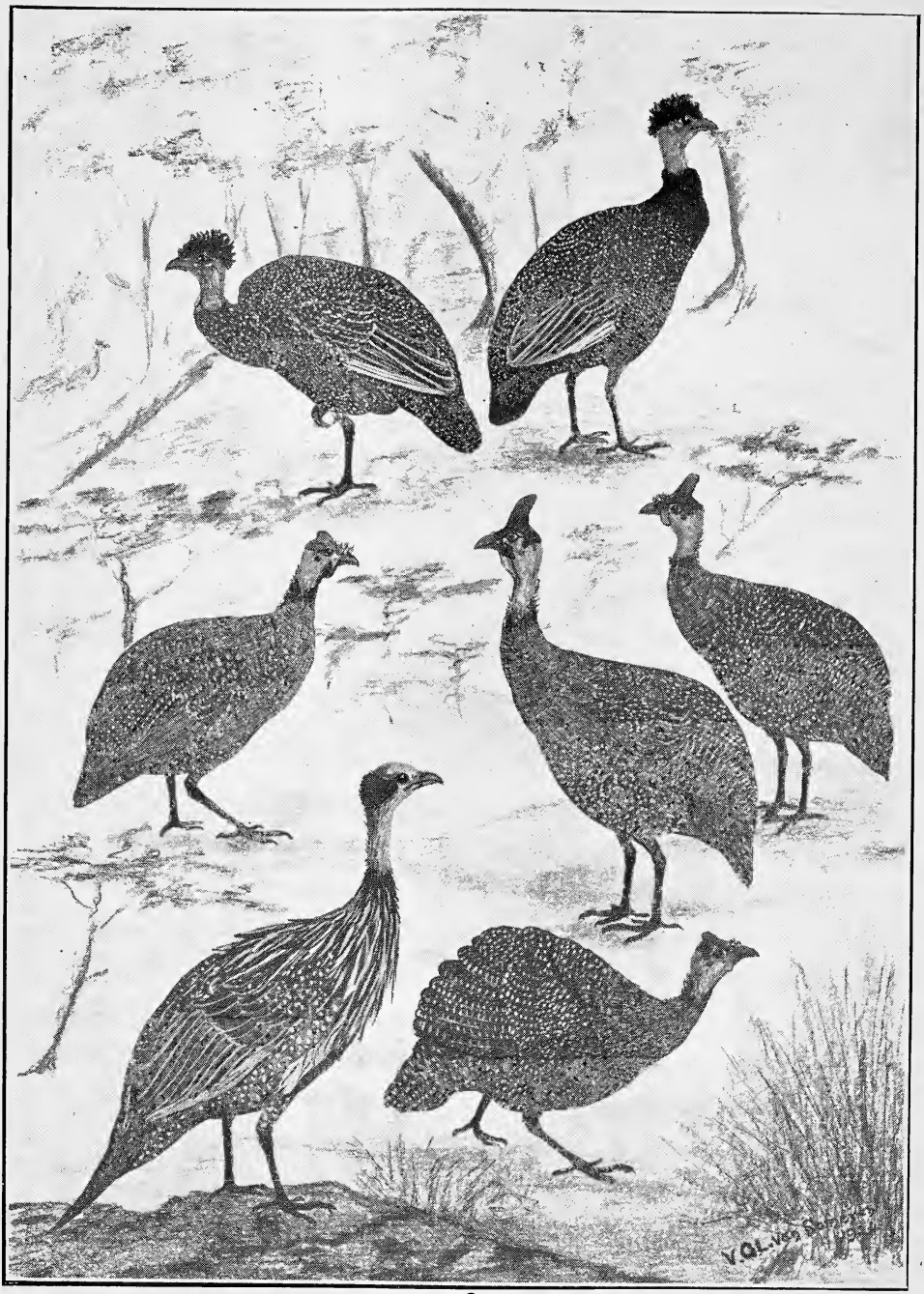
FRONTISPIECE.



1, Guttera pucherani. 2, Guttera e. seth-smithi. 3, Numida m. rendilis.
4, Numida reichenowi. 5, Numida m. somaliensis. 6, Numida m. major.
7, Acryllium vulturinum.

THE BIRDS OF KENYA AND UGANDA.

Part I.

by

V. G. L. van Someren, M.B.O.U., C.F.A.O.U., C.M.Z.S., etc., etc.

INTRODUCTION.

The lack of a popular Handbook on the Birds of Kenya and Uganda has been a long felt want, and in order to fill, in some slight measure, this gap in the literature pertaining to the Natural History of these Territories, it is proposed to publish in the Journal a series of Papers dealing with this subject.

Our knowledge of the local birds has not reached the same degree of perfection as our insight into British birds, and these notes must, of necessity, be incomplete so far as general habits are concerned.

In order to popularise the Series it has been thought advisable to commence these Papers with notes on the "Game Birds," although this will entail a departure from the recognised order of Classification.

It is a remarkable fact, that, although the "Game Birds" are plentiful and are daily shot for the "pot," there is still a great deal to be ascertained regarding their habits, and a lot of systematic work in connection with geographical races and their distribution, yet to be done.

This first instalment contains notes on the Guinea-Fowl of Kenya and Uganda.

In order that the various terms, referring to the feathering, may be understood, the appended sketch should be consulted.

In dealing with the birds of these Countries it must not be forgotten that within these territories there exist such extremes of altitude and climate as to produce a marked influence on the Avifauna of the regions.

Considering these factors and the position of these countries it is not surprising to find that their Avifauna is of a very varied and complex nature. To emphasise this point I take the liberty of reproducing a chart published in Novitates Zoologicae Vol. XXIX./1922, showing the various avifaunal areas, and also of repeating my notes relevent thereto.

The whole of the Western Provinces of Uganda and the central area can be looked upon as West African in character, somewhat modified in type. When we consider the northern territory we find Sudan and South Ethiopian forms represented, and in the eastern districts a mixed avifauna showing South Ethiopian and East African elements.

It should be noted here, however, that birds which may be taken to be typically western in type, find their way into the Elgon area, North Kavirondo, and the Mau Hills, extending more or less southward to what was the old political boundary between Uganda and East Africa.

At this point I should like to draw attention to the extraordinary distribution of certain species which are found on the Elgon-Nandi ranges, and which, although not occurring in Uganda and south of Lake Victoria, yet appear again in the Ruwenzori-Kivu area, in some cases exhibiting no change, in others showing a marked intensification of colour so as to be reckoned as geographical forms. As examples of this we have *Sylvietta leucophrys*, *Trochocercus nigromitratus*, *Chlorophoneus dohertyi*, and *Campothera taeniolaema*.

In the case of East Africa we have to consider Ethiopian, Somali, and South African influences; but in practically all instances the birds exhibit modifications in plumage justifying the recognition of races.

From this point we naturally come to the consideration of the effect of the climatic and topographical influences on the bird-life of the countries.

The zones or areas, as indicated by the chart, carry in them certain species and forms which are more or less confined to these areas, but it must be understood that these areas are still provisional to a certain extent.

That various factors—such as climate, altitude, etc.—had influence on the evolution of races and species has been long recognised, but insufficient regard has been paid to these points in connection with the birds of East Africa and Uganda. Thus, when they are considered, it is not surprising to find that we must recognise more races and species than hitherto.

The various zoogeographical zones or areas are most marked when we study the distribution of the Larks and the Warblers.

What I call the " thorn bush zone " extends throughout the eastern half of Kenya, north into Eastern Uganda, and encircles on the east the high plain and Alpine zones. But even in this " thorn-bush zone " races of the same form are found, produced no doubt by local conditions.

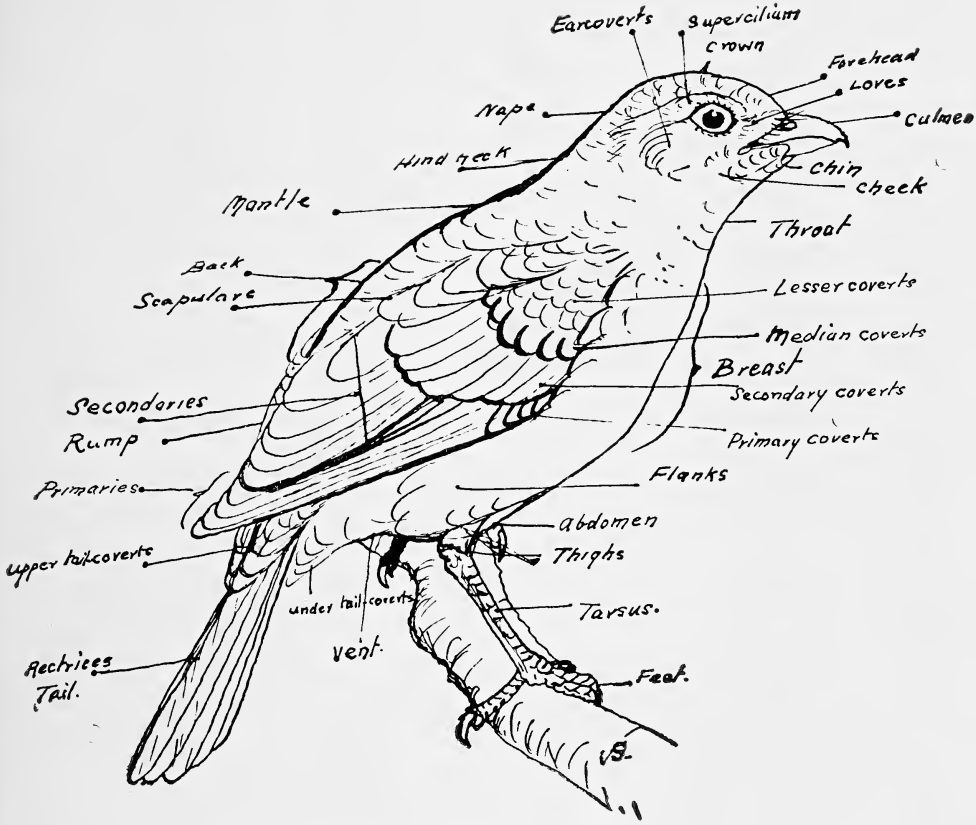


Diagram shewing nomenclature of external parts.

FAMILY.—PHASIANIDAE.

GENUS.—**NUMIDA.**

GUINEA-FOWL.

Numida reichenowi, Og.-Grant. Ukamba Helmeted Guinea-Fowl.
Ref. Og.-Grant, Ibis 1894, p. 536.
Type locality, Kilungu River, Ukamba.

Distribution: Teita, Taveta, Loita and Kedong. Ukambani to north-east Kenia.

GENERAL DESCRIPTION: ADULT.

The adult plumage is black, heavily spotted with white. The feathers on the lower breast, flanks, thighs and under tail-coverts are black with well defined circular or ovoid white spots; each feather of the breast narrowly edged wtih white.

The abdominal feathers are more barred than spotted, whilst those of the upper breast and lower neck are more finely spotted, the majority of the spots coalescing, thus forming alternating bars of black and white. Each feather is edged and tipped with bluish white, (in newly moulted birds) or white; this edging does not show up distinctly owing to the loose nature of the barbs at the margins of the feathers.

The upper part of the neck is bare, bright blue at the sides, and purply blue to blackish on the throat and hind neck. Two loose folds of skin, pendent from either side of the upper throat, are pale blue along the upper free edge and dark blue at the base.

A few decomposed hackle-like black feathers are present at the junction of the bare skin with the lower neck feathers in front, becoming more numerous in the hind part, and extending up the back of the neck for some little way; most of these feathers in the latter area are directed upwards, thus forming a scanty ruffle.

The feathers of the mantle, scapulars, lesser coverts, inner secondaries, rump upper tail-coverts and tail are black with small white spots, each spot being enclosed in a diamond-shaped network of fine dotted lines. The wing-coverts conform to this type of colouration, but the spots are more irregular and the net-work more broken. The spots on the secondary-coverts are arranged in rows; those on the margin of the outer web are elongate. The inner primaries and the secondaries are black with rows of white spots and numerous oblique lines on the margin of the outer web, giving to this area a banded appearance.

The head which is bare, except for a few hair-like feathers round the ears, on the eyelids, and on the posterior aspect of the nostrils, is

surmounted by a horny helmet, the base of which extends from the base of the bill to the occiput. The casque which is horn-brown in colour, is long and laterally compressed and deeply and irregularly grooved at its base. The base of the horn is red.

The skin in front of the eye, and the wattles dependent from the upper margin of the gape, are bright red.

There is considerable variation in the size and colour of these wattles, some have part of the base, blue in colour.

The size and shape of the helmet is not constant, some are long and tapering, with a straight front edge, others are rounded at the tip and curve backwards. There are *no* bristles between the nostrils. Legs blackish-brown; bill yellowish-horn at tip, darker at base.

JUVENILE:

The newly hatched chick is pale buff below and light orange brown above slightly paler on the back. The head and dorsum are striped with blackish-brown, while the flanks and wings are spotted with this colour. Growth is rapid and the feathering of the wings, tail and breast is quickly assumed.

In first plumage, the underside is buff with slight speckling in the region of the breast. The feathers of the mantle and wings are rufous brown freckled with blackish and edged with sandy-brown. The dorsum is pale greyish-buff with a broad central and lateral stripes of brownish-black. The head retains the feathering of the chick stage. The bill is pinkish-brown. The legs and feet are pale pink, to flesh-brown.

In the second plumage, evidence of spotting is present on the lower neck, breast, flanks, and wing-coverts. The wings, tail and lower back become conspicuously barred with buffy white, and the mantle with rufous brown and blackish. In this stage the colour of the head and neck is not altered. With the third plumage, spotting becomes general over the whole body, but the spots are greyish or tinged with buff, whilst the feathers are brown-black, not deep black. The head and neck commence to lose the fur-like feathering and the helmet commences to grow. The head and neck which are now devoid of feathering, become dark brown in colour.

HABITS:

Throughout the greater part of the year these birds associate in large flocks, frequenting the thorn-bush and forested ravines. They are also to be met with in native cultivations. Very often a flock contains two hundred or more birds. When associated

thus they are very noisy, especially in the early mornings, and at sunset, just when they go to roost. They spend the night in trees.

During their foraging expeditions, these birds cover an immense area. The whole of this distance is covered on foot for they seldom take wing. They are remarkably good runners and when surprised in thorn-bush or shamba they trust to their running powers rather than to flight.

During a collecting trip in the Tsavo district I witnessed a huge flock partaking of a mid-day drink at a river bank. This particular spot was evidently a regular resort of the Helmeted and Vulturine Guinea-Fowls, and as I had plenty of time, I took up my position under a huge acacia tree on the opposite bank to the one frequented by the birds. I had not long settled down when my head collector whispered to me that a large flock was coming along.

I personally could neither hear nor see anything, but presently a small batch of a dozen birds topped the bank and descending the slope, walked on to a small rocky promentary and drank their fill. When these birds had scrambled up the bank their place was taken by batch after batch until over a hundred birds had satisfied their thirst. Thinking that the birds had disappeared I moved my position and walked up-stream passing behind a screen of shrubs which shut out the view of the water. Beyond these bushes one obtained a good view of a small clearing on the opposite bank where the thorn trees were not very dense, and here, to my intense surprise, I discovered the whole flock about to settle down to rest. I quickly took cover, and taking advantage of the noise made by the running water, I worked my way towards a spot from which a good view of the entire flock could be obtained.

Fortunately, the few birds stationed as sentinels had not observed my movements and one was able to study the birds when quite at their ease. Many indulged in dust baths, while others attempted a little friendly sparring. Others again, attended to their toilet, frequently helping one another in this business. It was a common sight to see a bird go up to another and commence nibbling at the others wattles or running its bill through the short feathers at the back of the neck. The recipient of such attentions would stand still as if enjoying such kindly thought, or, if the recipient happened to be a bird which had started a sand bath it would stop this operation and lying full out on its side would stretch its neck out to receive treatment.

Throughout the two hours during which I watched these birds the only sound made was a low call uttered by different individuals from time to time. As I was suffering badly from cramp I decided

to make my presence known. No sooner had I done so than the familiar warning cry was started by the sentinels, to be taken up immediately by a hundred startled individuals. A general stampede ensued. At first some of the birds ran here and there uncertain from which quarter danger threatened, but presently all went off in one direction. Once out of sight of danger, the calling ceased, but the retreat continued for more than a hundred yards. Not a single bird took wing.

The approach of the nesting season makes these birds rather quarrelsome. The males display and fight vigorously. The feet are used freely, but as these birds have no spurs, little damage is done.

The courtship display consists of a series of spasmodic runs, ending in an abrupt stop in front of the female. These manoeuvres are gone through many times while the female stands preening herself or goes on feeding apparently quite unconcernedly. During the run the wings are raised and expanded, but kept close to the body, giving to the bird a compressed appearance, or occasionally they are held away from the side and slightly drooped. Sometimes when the male has stopped in front of the female, he will pick up a bit of grass, making a low call the while. After pairng, flockng is abandoned, and each pair wanders off to select a nesting site. The nest is usually situated under a low bush, and consists merely of a slight depression in the ground sparsely lined with bits of grass and leaves. The eggs, from six to twelve in number are buff to brownish in colour, freckled with darker brown in the region of the pores. Incubation lasts about twenty-four to twenty-six days. The principal nesting months are May and June, November and December, though eggs are frequently taken in other months. The nesting season varies in different localities according to the rainy periods.

If several pairs of birds happen to nest in the same district, it is common to find that the parents pool their young when about a month old. Thus one occasinally puts up a flock consisting of four or five old birds and several squeakers obviously belonging to more than one brood.

Although frequenting native shambas, these birds do little damage to crops; on the contrary, they do an immense amount of good as they feed largely on moths, locusts, crickets, and other injurious insects. Most of their food is obtained by scratching; roots and seeds being eagerly sought after.

From a sporting point of view, these clumsy birds offer little attraction. Their small wings and heavy bodies preclude long or sustained flight. Occasionally one is able to put these birds up with the help of dogs, but if they rise at all they make for the nearest large

tree. From such a situation they can be dislodged, amid hoarse and discordant protests, and an occasional sporting shot obtained.

These birds make three distinct calls—a low single note uttered occasionally when feeding, or resting; a series of notes, the first long, followed by two short ones of a higher tone uttered particularly by the male birds; and the usual harsh discordant note of alarm.

Numida ansorgei, Hartert. Nakuru Helmeted Guinea-Fowl.
Ref. Hartert, " Under the African Sun," 1899.
Type locality, Nakuru Lake.

Distribution: A limited area situated between the Aberdares and the Mau extending from Gilgil to south Solai.

Original description of *Numida ansorgei* Hartert ex Ansorge, W.J. " Under the African Sun," &c., p. 331. No. 40.

" An adult male of a guinea-fowl, shot at Lake Nakuru, on March 28, 1898, cannot be united with one of the described forms. It stands probably somewhat between *N. reichenowi* and the form named *N. intermedia* by Oscar Neumann. It differs from *N. reichenowi* in the form of the helmet, the high ridge of the caruncles at the base of the bill, the broad, not narrow and not hair-like feathers on the back of the neck, and the colour of the wattle at the gape and the barred neck-feathers. It differs from *N. intermedia* Neum. in the beak being blackish-green, not red, the larger wattle at the gape, and their colour, and probably also the more spotted chest. The type-specimen has on the hind-neck, just below the head, a bunch of broad pointed feathers, which seem to point upwards; the feathers below this bunch are very finely, but regularly barred with numerous white bars. The red naked skin on the nape is divided by a narrow black line in the middle; the wattle at the gape is broad and largely extended in front and behind, but not very pendent; and there is a red spot in front as well as on the hind-tip. " Iris red-brown." Wing 282 mm. tarsus 75, middle toe with claw 55, helmet in a straight line from the bottom 34, bill 24.

From *N. coronata* which is not yet known to occur North of the Zambesi it presents many points of difference, notably the bunch of feathers on the hind neck, the deep black ground-colour, the form and colour of the wattles."

Numida mitrata. Pall. Coast Helmeted Guinea-Fowl.
Ref. Pallas, Spic. Zool. 1767.
Type locality, Mosambique?

Distribution: Coast area from Vanga to the Sabaki River, inland to Samburu and the Shimba Hills.

General Description: Adult.

Plumage black, spotted with white. The helmet is short, conical, and rugose; reddish in colour at the base, and becoming yellowish-horn at the tip. The base of the helmet extends from the root of the maxilla to the occiput. There are no bristles or caruncles between the nares. The sides of the head and the whole of the neck are bright blue. A loose fold of skin extends from the chin and dividing into two, passes to either side of the neck just above the commencement of the neck feathering. The wattles at the gape are long and pointed, the basal two-thirds bright blue in colour, the terminal third red. The bill is horn-yellow at the tip, deepening to reddish-brown at the base.

There are a few hair-like feathers scattered over the front and side of the neck, becoming more plentiful and hackle-like over the posterior surface; these hackle feathers form a ruffle in this area.

The feathers of the lower neck and upper breast are finely barred, black and white, the bars being of equal width, giving to these areas a general greyish appearance.

The rest of the plumage is very like that of Reichenow's Guinea-Fowl but the spotting is finer throughout.

The legs and feet are dark horn-brown.

Juvenile:

The colour of the chick of the Coast Guinea-Fowl is rather more rufescent than that of inland birds, but the pattern is similar. In the first feathered stage this difference is also present. The sequence of plumage change is similar in all the Helmeted Guinea-Fowl.

Habits:

Throughout the whole of its range *N. mitrata* can now be considered scarce. The species has been sorely harried by the coast natives with the result that one seldom sees a large flock. Ten to twelve birds usually form a pack, but in the more secluded districts large flocks may be met with. Without some sort of protection the species will in time become a rarity in Kenya.

The thorn-bush and grass country west of Samburu still forms a favourite haunt of these birds. In habits they hardly differ from other species of the "helmeted" group. They are swift of foot and appear loth to fly; in consequence they offer little sport.

The nesting season would appear to correspond more or less with the latter part of the rainy seasons. Eggs were found in the Shimba district in June, and young in first feather in Giriama in January. The eggs are of the usual type, buff to sandy-brown in colour with the pores of a darker shade. The nest is made in thick grass or under a dense shrub. A few bits of grass placed around a slight hollow, constitute the entire nest. The bird is a close sitter and is usually reluctant to leave its nest.

Ground vermin, such as the little brown Mungoose, take considerable toll of the eggs and chicks, and it is no uncommon sight to see parent birds with one or two young instead of eight to ten. The natives snare the birds as they come to their nests.

Numida meleagris rendilis. Lönnb. Rendile Tufted Guinea-Fowl.
,, ,, baringoensis, C. Grant. Syn.
Ref. Löonb. K. Sven. Vet.—Ak Hand. 1911.
Type locality. Between Meru and Rendile.

Distribution: N.E. Kenia to Baringo. S. Rudolf to the Turkwell and Suk and Kamassia.

Description: Adult.

Very like *N. reichenowi* in general plumage but rather darker in appearance. The presence of a tuft of bristles between the nostrils at once distinguishes this species from the southern Helmeted Guinea-Fowl. The helmet is strongly developed, both in male and female, laterally compresed and rounded at the tip. The bare skin of the sides of the head, the neck, and the wattles, are blue in colour.

The outer webs to the secondaries, besides possessing oblique white bars, also have wavy irregular lines passing through the black interspaces, giving to these feathers a freckled appearance.

This race lacks entirely the terminal white bars to the secondary coverts (found in the typical Abyssinian form).

Juvenile:

In general scheme of colouration, the newly hatched chick and the young in first feather conform to the description given under *Numida reichenowi*. It is in the third stage that one finds appreciable differences. Indications of the nasal bristles are present and besides the general paler underside, the upper surface is much lighter in colour due to pale buff spotting and barring of the mantle and wings.

The eggs of this Guinea-Fowl cannot readily be distinguished from those of other " helmeted " species; they are buff to pale brown, with most of the pores indicated by a deepening of the brown pigment. Ten to fourteen eggs are recorded as normal clutches.

Habits:

Throughout the whole of its range, this bird occurs in very large flocks. A pack sometimes consists of two hundred birds or more.

During the dry weather, it is sometimes possible to locate these birds feeding on a plain, by the clouds of dust thrown up as they scratch the ground.

The gathering of a flock, at sunset, preparatory to going to roost, or the flocking at a waterhole, is a wonderful sight. From all directions batches approach on foot. Their agility and jumping powers are remarkable. A sudden disturbance sends the birds off, by leaps and bounds, to the nearest trees or embankment, amid much hoarse cackling. From these elevations they continue to protest, the cries being uttered in concert by dozens of individuals.

Unlike most birds, these Guinea-Fowl appear loath to leave their roosting places until the sun is well up. Once they are on the move they cover an immense distance.

These birds are certainly most plentiful in the Northern Guasso Nyiro districts, in the Suk country and along the Turkwell River.

Numida meleagris major. Hartl. Uganda Tufted Guinea-Fowl.

Ref. Hartl. Able. Bremen. 1883.
Type locality, Kakkala, N.W. Uganda.

Distribution: North Uganda to Ankole, and eastwards through Uganda proper, to east of Victoria Nyanza, including north and south Kavirondo.

The Tufted Guinea-Fowl of these northern districts have been divided up into several geographical races by various Systematists and if all the forms were valid we should have the following races included in this survey:—

N.m. toruensis, Neum. West Uganda from Ankole to Toro and S. Lake Albert, extending into Uganda Proper.

N.m. major. Hartl. Northern Province of Uganda.

N.m. neumanni. Erl. Usoga, east to Kavirondo.

N.m. macroceras. Erl. Rudolf district.

For the purposes of this paper it will be sufficient to place all under the oldest name as above.

Description: Adult.

The Uganda Guinea-Fowl is very like *N.m. rendilis* in general scheme of colour, but differs from that race in the following particulars:—The helmet is much smaller and sometimes rudimentary, reddish in colour, usually pointed and inclined backwards. The wattles at the gape are fairly broad at the base, but otherwise long and tapering, and generally blue in colour; but in some individuals the wattles are red tipped. (Ankole and Usoga). The nasal bristles are short, stout and reddish in colour. The naked parts of the neck, throat, and sides of the head are bright blue with a paler irregular line down each side of the neck. The bill is yellowish horn at the tip, becoming red at the base. There is a well developed patch of black feathers at the commencement of the neck feathering. The feathers of the lower neck and the upper breast are black with narrow white wavy lines, the white bars much narower than the black inter-spaces, thus giving to this area a dark appearance. The spotting on the mantle, back, rump, and tail is small, while the enclosing white dotted network is rather more conspicuous than is found in the Rendile bird; thus one might describe these feathers as being a mottled greyish, with white spots outlined in black. The wings are marked as in *N.m. rendilis*. The legs are dark horn-brown.

Juvenile:

The scheme of colouration in the chick is similar to that found in the other Tufted Guinea-Fowl. The stripe on the head is slightly different. A central blackish brown stripe commences at the base of the maxilla, and extending back, widens out in the region of the hind crown, and becomes narrower at the occiput. This stripe is flanked on either side by three lines, the outermost commencing just above and in front of the eye. A fourth line starting at the posterior angle of the eye passes back through the ear opening and at this point is met by a fifth streak which starts at the gape. A further narrow line marks the angle of the jaw.

In the first and second feather, the mantle is rufescent brown with wavy cross bars of blackish brown and buffy brown. The upper breast is rufescent, streaked with blackish, with a few white centres to the more elongate feathers of the neck. The lower breast and flanks are sandy; each feather with brownish angular markings in the centre, and buff shaft streaks. The abdomen is greyish buff with grey brown cross bars.

The rest of the plumage agrees with *N.m. rendilis* of a similar age. The spotted plumage develops rapidly, appearing first of all on the breast, flanks and lesser wing-coverts.

Habits:

Although widely spread throughout suitable localities, I have never seen these birds in very large flocks, except in N.E. Uganda. Twenty to thirty birds appear to be an average association for the southern area of distribution.

The scrub and "Game country" are the localities favoured by these birds, but native cultivations and edges of forest land are sometimes visited.

In general habits, and nesting operations, these birds do not differ from other members of the group. They are trapped by the natives, in snares placed in position near the nest or captured by hand while actually sitting. The Maragoli adopt the basket method of capture. A toto is detailed to watch the birds, and having located the nest, the spot is marked. A rough basket of twigs is constructed and armed with this, the nest is visited toward evening. The parent bird being a very close sitter, is very easily captured by placing the basket on top of her. The method is one which should be strictly prohibited, as not only are a large number of breeding birds thus destroyed, but numerous eggs are damaged as the bird struggles to free herself.

The only place where I have obtained really good sport with these birds has been along the Maragoli and Suk Escarpments. Here, owing to the rugged formation of the hillsides, one can drive the birds and, with good dogs, cause them to fly out over the dongas to reach the opposite side. In other situations the birds are difficult to put up. They run in some cases as fast as a Hare and if one appreciates ground shooting, such can be obtained in fairly open country.

Numida meleagris somaliensis. Neum. Somali Tufted Guinea-Fowl.
Ref. Neum. Orn. Monatsb. 1899.
Type locality, Somaliland, N.W.

Distribution: Throughout Jubaland to Waghier and the Lorian.

Description: Adult.

Conforms in general type of plumage with other members of this group but rather more greyish throughout, due to the pronounced white speckled network surrounding the white spots of the feathers. The feathers of the lower neck and upper breast are extremely finely barred with alternating wavy lines of black and white; the white lines predominating.

The secondary covets are markedly black with clearly defined white spots so that this area stands out conspicuously from the rest of the more greyish upper plumage. The feathers of the breast are pale, widely margined with white, rendering this area pale, compared

to the rest of the plumage. These white edges do not show up as definite lines owing to the loose nature of the tips of the feathers. The white spots on the outer webs of the inner secondaries are irregular in shape, and most have a black mark towards the lower edge. The outer webs of the outer secondaries have a general finely speckled appearance, due to the irregular and obsolete nature of the oblique bars being obscured by a fine white spotting. The spotting along the outer webs of the inner secondary coverts is modified in a similar way to those of the secondary feathers.

There is a very small patch of black hackle-like feathers at the base of the hind neck.

The most conspicuous charecters which distinguish this race are: the very small helmet (in some specimens quite rudimentary) and the exceptionally large tuft of long fine white bristles at the base of the maxilla. The helmet, which is reddish in colour, commences at the base of the bill, but does not extend as far back as the occiput, but stops just short of it, and is not continued right down behind the eye. The bare parts of the rest of the head, and neck, are blue. The wattles are well develped, elongate, and project back; the basal two-thirds blue, the remainder red in colour.

This is the smallest race of Tufted Guinea-Fowl found within the boundaries reviewed in these notes; the greatest difference being found in the size of the bill, head and legs.

JUVENILE:

The young in down is similar in pattern to that of other races, but is paler, and less striped on the head. In the first and second feathered dress the plumage is noticably paler than in *N.m. reindilis*, or *N.m. major*. The head is pale buff with a broad central blackish stripe flanked on either side with two narrow blackish lines, extending from the nares to the occiput. The feathers of the lower neck are pointed, white in colour, with blackish edges.

The breast feathers are greyish buff with darker bars of blackish and white. The mantle, rump, and wing coverts are brownish speckled with blackish and barred with buffy brown and buff. The legs are light brown and the bill dark brown.

HABITS:

These birds frequent the thornbush and acacia country, wandering out into the rocky and grass country when feeding.

They occur in flocks of forty or so and offer easy shooting. Their call is typical of the "helmeted" Guinea-Fowl, but compared with *N. reindilis*, the pitch is higher.

The eggs of this race conform to the general type. They are almost oval, slightly pointed at one end, sandy buff in colour and with darker pores.

Genus.—GUTTERA.

CRESTED GUINEA-FOWL.

Guttera edouardi seth-smithi. Neum. Uganda Black-necked Crested Forest Guinea-Fowl.

Ref. Neum. B.B.O.C. XXiii. 1908.

Type locality, Unyoro, Uganda.

Distribution: Forests of Uganda, Kavirondo, Nandi south to Mau.

Description: Adult.

General plumage black, spotted with pale blue.

A full crest of long curly feathers extends from the base of the bill to the centre of the cranium. The feathers of the forehead are directed forwards whilst those of the hind crown are long and lie well over the occiput.

The rest of the head and neck are bare, cobalt blue on the back and sides and dull red at the chin and throat.

Rudimentary wattles are present at the gape. There is a slight fold of skin on either side of the neck just before the commencement of the feathering.

A wide collar of black feathers surrounds the lower neck, extending on to the upper breast in front.

The feathers of the mantle, back, rump, upper and under tail-coverts, breast, flanks, thighs, abdomen and lesser wing-coverts are black, spotted with light blue, each spot outlined with darker blue. Each feather is narrowly edged with pale blue.

The secondary-coverts are black with lines of semi-confluent pale blue spots. The outer primaries are dark brownish black with two rows of small white spots on the outer web. The inner primaries have wavy lines of pale blue on the outer webs and oblique narrow wavy lines on the inner webs. The outer five secondaries are black with wavy pale blue longitudinal lines and broad white edges to the outer webs; the inner webs have interrupted wavy blue lines. The rest of the secondaries are black with longitudinal rows of pale blue spots, the spots on the outer webs are confluent, thus forming irregular lines. The tail is black, finely spotted with blue on the basal two-thirds of each feather.

The bill is greenish horn colour; the legs and feet leaden grey-brown.

JUVENILE:

The young in first feather is as follow:—The head is ochraceous buff, lined with black ;a central line commences at the base of the bill, passes back over the crown and at the top of the head widens out to form a large black patch on the hinder part of the crown and neck; a narrow black line commences at the nostril and in the region of the lores divides into two—the upper line passing over the eye breaks up into a mottled superciliary stripe, the lower, skirting the upper border of the gape passes below the eye, to end in a mottled area in the region of the ear. The throat is pale buff, while the breast feathers and those of the flanks are blackish, widely edged with rusty and buff.

The feathers of the mantle and those of the wing coverts are rusty brown, lined on the outer web with black and margined with ochraceous. The secondaries are greyish, finely speckled with black, and tipped with pale buff. The primaries are greyish black, tipped with buff. The abdomen is greyish. Bill horn-brown. Legs and feet pinkish brown.

HABITS:

The breeding season of this species would appear to be little affected by the rainy seasons, as I have found young in the first dress in January, March, June, August and December, and eggs in January. Eight to ten eggs form a normal clutch. They are large and white, with a semi-matt surface with well marked pores.

The nest is a slight depression in the ground, sparsely lined with leaves and bits of grass, usually contructed under a bush or at the base of a large tree or below an overhanging rock or bank.

These birds are found in small flocks of a dozen or so individuals within the dense forests; they however frequently come out into the old deserted native forest clearings, especially towards the afternoon.

The food consists largely of insects, seeds and young shoots. They are also fond of small land molluscs, which they turn up when scratching among the leaves.

White-ants are eagerly sought after and it is when feeding on these that one comes across these birds on the edges of forests.

The Crested Guinea-Fowl is one of the shyest of the game birds, and in consequence, extremely difficult to procure.

Traces of these birds are frequently found; places where they have been scratching—or perhaps an odd feather or two lying about, but one can hunt a forest for weeks without ever seeing or coming across them. Occasionally if one is walking through a forest patch towards evening, one may be fortunate enough to catch a glimpse of these birds as they scurry across the path. Two calls are uttered

by these birds, one a low whistling trill, made while they are feeding, and the other, a loud, oft-repeated churring. They call mostly in the morning and again of a late afternoon.

Owing to the nature of the forests in which these Guinea-Fowl live, one can obtain but little sport with these birds. Hunting them with dogs is a method adopted by the natives and some such measure usually produces one or two birds, but even when treed, they give one little chance of good shooting. The only method of securing any sport with these birds, other than by using dogs, is to organise a drive in a limited area of forest, through which one or two rides have been cut. If a gun is stationed at these paths and the birds are driven and made to cross these clearings, it is possible to obtain a rapid right and left, but no more.

If a bird is winged and makes off into the dense undergrowth, pursuit is hopeless, unless one has a good dog. Even then, owing to the speed at which it runs, capture is not always a certainty.

There is another race of Forest Guinea-Fowl belonging to this group, which extends within the Kenya boundaries, this is *Guttera edouardi suahelica*, Neumann. B.B.O.C. XXIII., 1908, which, according to Chapin (Ref. Zool. Afr. Vol. XI., 1923) is doubtfully distinct from *G.e. granti*. It differs from *G.e. seth-smithi* in having less red on the bare throat and neck. The form extends into the forests of Nguruman, South Masai Reserve.

Guttera pucherani. Hartl. Curly Crested Blue-necked Forest Guinea-Fowl.
Ref. Hartl. J.F.O., 1860.
Type locality, Zanzibar (probably mainland).

Distribution: The forests along the Coast from the Juba to Vanga, inland to Taveta and Kilimanjaro, north to Kikuyu, Escarpment, and Ngong, and east to Mt. Kenia and N. Jubaland.

DESCRIPTION: ADULT:

Very like *G.e. seth-smithi*, Neum. in general colour, i.e., black with blue spots, but with the sides of the head, the chin, throat, and wattles at the gape, red in colour; the rest of the bare area, blue. There is no black collar on the lower neck, the blue spotted feathers continuing right up to the area of bare skin.

The black crest is closer and more curly than in the " black-collared " species.

A very pronounced deep fold of skin surrounds the back and the sides of the neck, passing forward and upwards to the commencement of the red area in front of the neck.

Long black hair-like feathers are present on the chin, cheeks and round the ear openings; while short hairs are scattered over the back of the neck.

The rest of the plumage resembles the Uganda Crested Guinea-Fowl.

JUVENILE:

The young in first feather resembles the young of a *G.e. sethsmithi* of a similar age, differing only in the colour and freckling on the wings.

HABITS:

These birds go to nest toward the latter part of the rainy seasons, December, and May to June. The eggs are large, white or creamy, with a dull surface and well marked pores.

During the nesting season, these birds are remarkably silent and even more retiring than at other times. Flocks are small and although the species is widely distributed, one seldom comes across them. They frequent the forests and areas along the coast where thick bush gives sufficient cover.

They are not as partial to the dense forest undergrowth as is the "Black-collared" species, and quite frequently one finds evidence of these birds along the more open margins of the forests; and in forests where there are wide breaks, one may on occasion catch a glimpse of a small flock, busy scratching amongst the fallen leaves, or having a sand bath.

In the coastal districts I have sometimes surprised these birds in long grass quite a distance from the nearest thicket, and my experience of the coast bird is, that they are not quite so retiring as these found in the heavy inland forests.

While feeding they utter a soft double note, repeated several times in succession, but the call usually heard is a loud rattling cry somewhat like the noise made by a "devils rattle." I have noticed that this is frequently uttered before a rain storm, and invariably when the birds are excited.

My experience has been that this species takes more readily to trees when flushed by a good dog than does the "Black-collared" species, but in spite of this they offer little chance of good sport.

NOTE: The birds from Jubaland are rather smaller than those from central and south Kenya, and the formation of the crest is different. They may possibly represent a distinct race.

Genus ACRYLLIUM.

Vulture-like Guinea-Fowl.

Acryllium vulturinum. Hardw. Vulturine Guinea-Fowl.

Ref. Hardw. P.Z.S. 1834. p. 52.

Type locality, probably East Africa.

Distribution: The thorn-bush country from Kilimanjaro to Ukambani north to the Northern Guasso Nyiro, westwards to north Karamajo and eastwards through the Northern Frontier to Jubaland.

Description: Adult.

Head and neck devoid of feathers, except for a patch of short, velevety brown feathers in the region of the nape and extending on either side to the angle of the mandible. A few hair-like feathers are scattered over the lower and back part of the neck. The lower neck and upper breast are covered with long, black, hackle feathers, each with a wide white shaft stripe and broadly margined with blue. A line of glossy black feathers runs down the centre of the breast, gradually widening out to cover the whole of the abdomen. On either side of this black breast-streak, there is a large patch of blue supported on the flanks by white-spotted purple feathers, each white spot broadly outlined with jet black. The thighs are covered with white-spotted black feathers. The feathers of the mantle are elongate and slightly pointed, black in colour, very finely vermiculated with white, and with a conspicuous white shaft streak outlined in black. The scapulars and the majority of the wing coverts are black, finely vermiculated and spotted with white dots, irregularly outlined in black. Some of the scapulars have subterminal white shaft spots. The secondary and outer wing coverts are jet black with three lines on the outer webs and two rows of white spots on the inner webs. The primaries are brownish, with a few spots on the margin of the outer webs and bars of white spots towards the tips on the inner webs. The outer secondaries are black, edged with purplish on the outer web, followed by a slight freckling of white, and with lines of pure white parallel to the shaft. The mid-secondaries are conspicuously lined with white on the outer webs while the inner ones possess in addition, extremely fine white vermiculations.

The inner webs of most of the secondaries have three rows of dotted lines; in the outer secondaries, the white marks in this region assume the appearance of broken transverse bars. The rump feathers

are similar to those of the scapular region. The upper tail-coverts are black with small white spots surrounded with a white network. The tail is long and wedge-shaped, the central pair of feathers being markedly elongate and projecting far beyond the rest. In colour, the three central pairs resemble the upper tail-coverts, while the rest of the rectrices are black with small white spots. The under tail-coverts resemble the outer tail feathers in colour. The bill is greenish grey and the legs and feet brown-black. The naked parts of the head and neck are cobalt-blue.

The sexes are alike in colour. The female is smaller and does not possess the four or five tarsal knobs found in the male.

JUVENILE:

The newly hatched chick is covered in down of a sandy colour, immaculate on the chin, throat and undersurface of the body, but striped and spotted with black and dark brown on the dorsum. The crown is more rufescent, and is ornamented with black stripes, the three central ones coalesce in the hinder part of the crown, forming a black patch in this area.

In first feather the young retains the head colouration found in the chick. The feathers of the mantle, scapulars, the inner wing coverts are alternately barred with black, buff, and rufous, and tipped with buff. The secondaries and inner rectices are black with bars of buff freckled with blackish and tinged with rufous towards the tips. The primaries are brown-black with bars of buff on the outer webs and tips. The outer rectrices are black with cross bars of buff.

The breast feathers are blackish, barred and fringed with pale buff. The flanks and abdomen are greyish, barred and tipped with pale buff. The feathers of the lower breast are washed with bluish. The bill is flesh-brown, and the legs and feet pinkish-brown.

The second feathered stage represents a transition between the first dress and the adult plumage. The feathers of the lower neck are replaced with black and white hackles and the flanks become spotted with white.

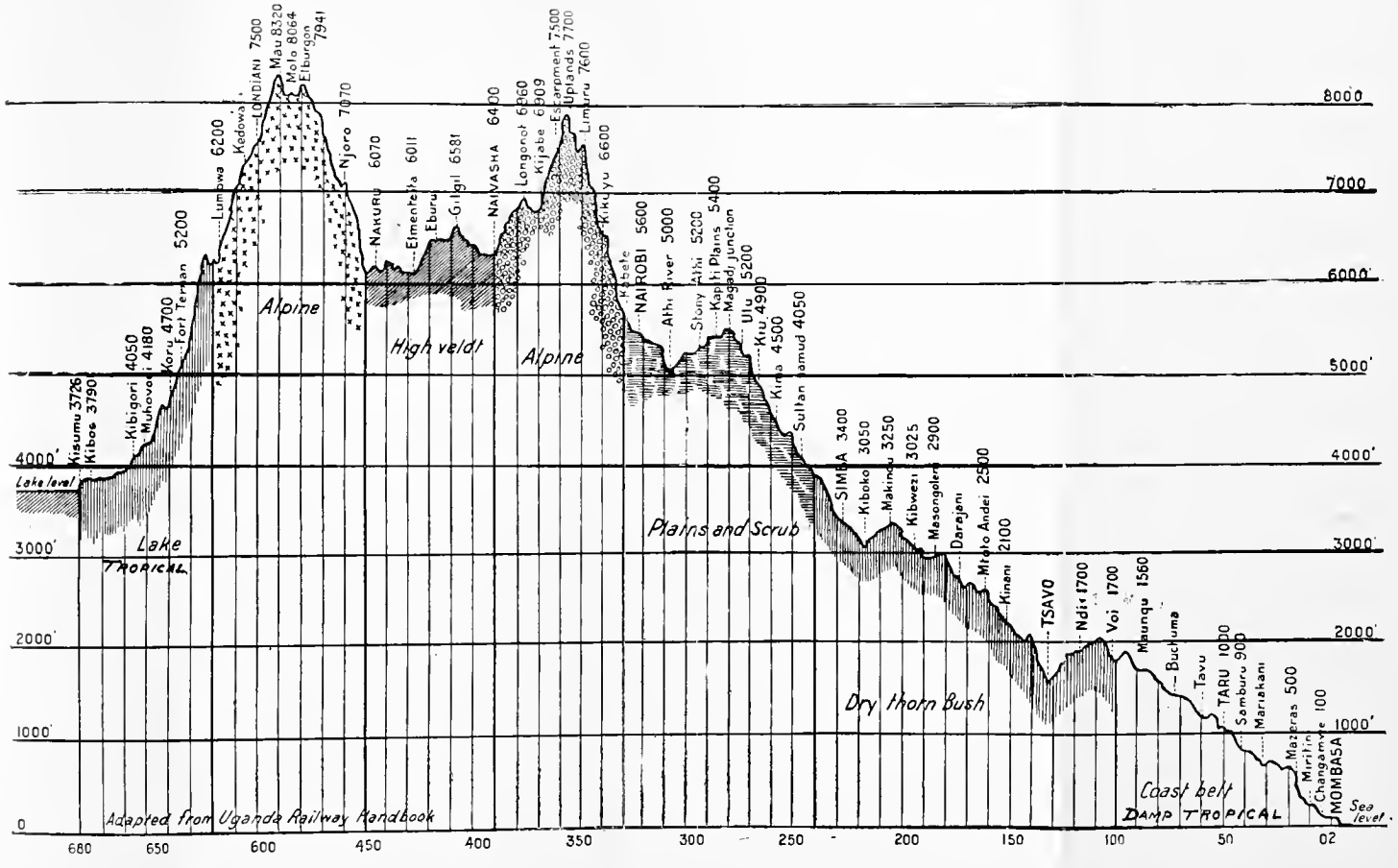
HABITS:

The Vulturine Guinea-Fowl is associated throughout the whole of its range with wilderness and dry thorn-bush country; the Serengeti and Yatta plains, the Northern Guasso Nyiro and desert land of Jubaland. It is a strange coincidence that the most beautiful starling, *C. regius*, and the handsomest Guinea-Fowl should be inhabitants of the same desert country!

The species is exceptionally plentiful in certain parts of Jubaland and even in other parts of its distribution the flocks consist of scores of birds. The largest flock observed by me contained well over a hundred birds. In habits these birds do not differ from the ordinary " helmeted " species.

They are perhaps a little less inclined to wander far afield when out foraging, and as a result one has on occasion been able to keep more or less in touch with a particular flock throughout the whole day. During my wanderings in the Tsavo area I located a spot used by these birds as a " collecting " ground before going to roost for the right. The situation was ideally placed, for nearby there was a rocky hill, and from this eminence I could watch the birds congregating and observe them at their evening parade. The birds turned up long before sunset, and although belonging to one large flock they appeared in small batches of twenty or so. The nesting season was just about starting, and the time thus extremely favourable for observing the display of the males. Here and there one would see a fine male in brillant plumage detach himself from the rest of the batch, and standing on a slight eminence, he would raise the upper part of his wings, keeping the tips close pressed into the body, the back and rump feathers being raised in between, and fully expand the tail. The legs would be brought close together, and drawing himself to his full height, he would take one or two short steps, first in one direction then another, and finally spreading the wings out he would launch himself into the middle of the nearest batch of birds. These birds, which had perhaps beeen peacefully preening themselves, would dart away in all directions, and taking a few hurried strides, would stop short, and wheeling round, return to the original place from which they were disturbed. Another male, dispensing with the advantage of a " setting " to his performance, having displayed his plumage, would rush at the nearest bird, and ducking under her, cause a wild leap into the air. These performances always ended with a general stampede of the rest of the birds. Each would scurry off for a few yards in one direction, and drawing up sharp, dart off another way, and finally, after a series of these spasmodic runs, quietly settle down, only to be rudely disturbed by some other excitable male. Right up to the last moment before flying up into the roost trees, these birds could be seen scratching in the ground in search of food. Seeds, roots, bulbs, green shoots and insects enter largely into their dietary and land molluscs are eaten with avidity. When the nesting time arrives, the breeding birds separate from the rest of the flock and wander off. At such times it is no uncommon thing to come across a pair or a single bird in the thorn-bush. The nest is of the usual guinea-fowl type, usually placed in thick grass protected by rocks or shrubs.

8000'
7000'
6000'
5000'
4000'
3000'
2000'
1000'
0
5200
Fort Tenan
Koru 4700
Muhoroni 4180
Kibigori 4050
Kibos 3790
Kisumu 3726
Lake level
Lake
TROPICAL
Adapted
Ndi 1700
Voi 1700
Maungu 1560
Buchuma
Tavu
TARU 1000
Samburu 900
Mariakani
Mazeras 500
Mirilin
Changamwe 100
MOMBASA
Sea level
Coast belt
DAMP TROPICAL
680
650
100
50
02


Kisumu 3726
Kibos 3790
Kibigori 4050
Muhoroni 4180
Koru 4700
Fort Terman 5200
Lumbwa 6200
Kedowa
LONDIANI 7500
Mau 8320
Molo 8064
Elburgon 7941
Njoro 7070
NAKURU 6070
Elmenteita 6011
Eburu
Gilgil 6581
NAIVASHA 6400
Longonot 6960
Kijabe 6909
Escarpment 7500
Uplands 7700
Limuru 7600
Kikuyu 6600
Kitale
NAIROBI 5600
Athi River 5000
Stony Athi 5200
Kapiti Plains 5400
Magadi junction
Ulu 5200
Kiu 4900
Kima 4500
Sultan Hamud 4050
SIMBA 3400
Kiboko 3050
Makindu 3250
Kibwezi 3025
Masongoleni 2900
Darajeni
Mtito Andei 2500
Kinani 2100
TSAVO
Ndii 1700
Voi 1700
Maungu 1560
Buchuma
Tavu
TARU 1090
Samburu 900
Mariakani
Mazeras 500
Mtiriini
Changamwe 100
MOMBASA
Sea level
Alpine
High veldt
Alpine
Plains and Scrub
Dry thorn Bush
Coast belt
DAMP TROPICAL
Lake level
Lake
TROPICAL
8000'
7000'
6000'
5000'
4000'
3000'
2000'
1000'
0
Adapted from Uganda Railway Handbook
680
650
600
450
400
350
300
250
200
150
100
50
02

The eggs are large and oval, white or cream coloured, with a semi-glossy surface.

From a sporting point of view, Guinea-Fowl offer little excitement, and the Vulturine is no exception. They take quite readily to trees when flushed, and owing to the nature of the thorn-bush they inhabit, one can occasionally obtain a few good flying shots as the birds break cover. The birds are not good flyers, and owing to the weight of their bodies they soon take to ground and trust to their remarkable running powers. A winged Vulturine is a lost bird unless a good dog is put on to trail it.

THE BUTTERFLIES OF KENYA AND UGANDA.

by

Rev. Canon St. Aubyn Rogers, f.e.s.
V. G. L. van Someren, f.e.s., f.l.s.

The primary object of this, and subsequent Papers on the Butterflies of Kenya and Uganda, is to stimulate interest in this most absorbing branch of Entomology.

The study of Butterflies is not an idle pursuit; it does not consist merely in the capture and "setting" of specimens and the classification of them; it goes far beyond that, and has a practical application to several problems of economic value.

An insight into the mysteries of evolution is afforded by the study of this group of insects, to an extent almost unequalled by any other Order. The gradual and persistent effect of Natural Selection is wonderfully portrayed in the colour, patterns and shape of the butterfly's wings. Not only do we find evidence of this in the "imagines" or perfect butterfly, but also to a remarkable degree in the larvæ and the pupæ.

The subject of these wonderful phenomena is too vast to be treated in these notes at any length, but wherever possible attention will be drawn to specimens which exhibit in any way, the remarkable results of natural selection.

Apart from this aspect of "butterfly collecting" there is a vast field of almost untouched work awaiting the attention of the ardent, patient and observant student: we refer to the systematic working out of life histories of the several species and races, noting particularly, the various food-plants; the natural enemies of eggs, larvae, and pupae; the sex proportion in complete families; the influence of climatic conditions on seasonal forms, etc, etc.; the association of larvæ with other insects; and the seasonal or spasmodic migration of the adults.

Photographic records of stages in the life history of these insects are invaluable and should be secured whenever possible.

Enough has been said to indicate that the study of butterflies in this country is still in its infancy. Mere collecting has claimed many devotees, but the investigation into the bionomics and economy of the insects has received scant attention. It is in the hope of rousing interest in these subjects that these notes are written.

Perusal of these pages will soon reveal how really little one knows of these marvellous insects.

An elementary knowledge of the classification of butterflies is essential to ensure study on sound lines, and as an introduction to the systematic lists which follow, the appended classification will be found of great utility.

Wherever possible, line-drawings and half-tone blocks will be used to illustrate the letterpress.

The most important characters which will be used in the classification of the large number of species are (1) the development of the fore legs and (2) the venation of the wings. The text figure will give the nomenclature of the different parts of the wings and the different veins. (Page 25.)

The two veins which bound the cell from the base are known as the *Sub-costal* and the *Median*.

A. Antennæ close together at origin; tibiæ with a pair of terminal spurs only.

B. Tarsi of first pair of legs imperfect, and the whole limb much reduced in both sexes.

Family 1.—NYMPHALIDÆ.

c. Discoidal cell of hind-wings closed.

d. Palpi very short, slender.

Sub-Family 1.—*Danainæ*.

dd. Palpi of moderate length or long, not slender.

e. Fore-wings short, broad; their nervures (veins) often swollen at the base.

Sub-Family 2.—*Satyrinæ*.

ee. Fore-wing much elongated, narrow; their nervures never swollen at the base.

Sub-Family 3.—*Acræinæ*.

cc. Discoidal cell of hind-wings open or incompletely closed.

Sub-Family 4.—*Nymphalinæ*.

BB. Tarsi of first pair of legs imperfect in male, perfect in female.

Family II.—ECRYINIDÆ.

f. Palpi very long.

Sub-Family 1.—*Libythœinæ*.

ff. Palpi of moderate length or short.

Sub-Family 2.—*Nemeobinæ*.

BBB. Tarsi of first pair of legs small in male, wanting in one or both claws.

Family III.—LYCÆNIDÆ.

BBBB. Tarsi of first pair of legs perfect in both sexes.

Family IV.—PAPILIONIDÆ.

g. Tarsal claws bifid; inner margin of hind-wings prominently rounded.

Sub-Family 1.—*Pierinæ*.

gg. Tarsal claws simple; inner margin of hind-wings hollowed; tibiæ of first pair of legs with a small process on the inner edge.

Sub-Family 2.—*Papilionæ*.

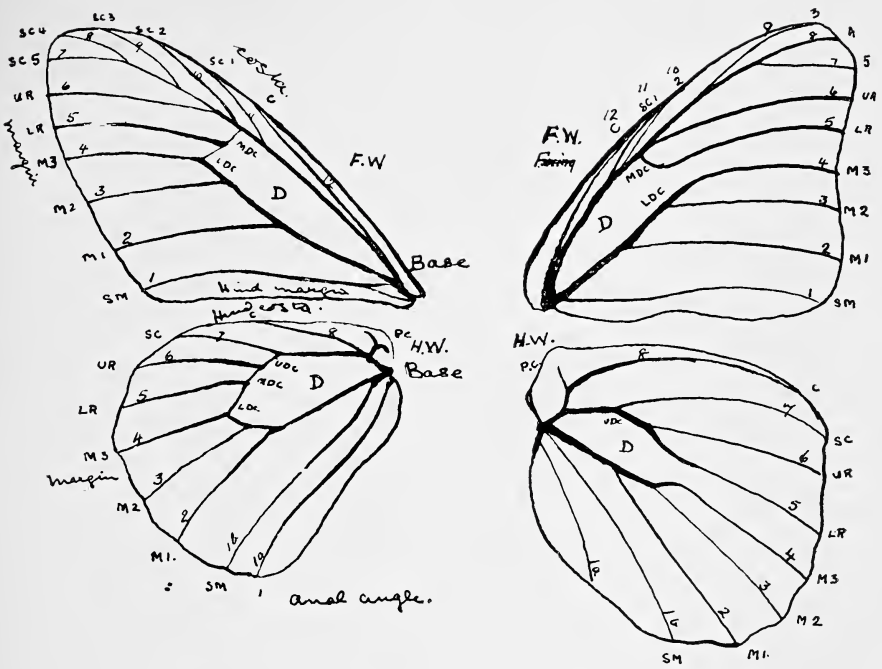
AA. Antennæ wide apart at origin; tibiæ of hind pair of legs with an additional pair of spurs rather beyond the middle.

Family V.—HESPERIDÆ.

Family I.—NYMPHALIDÆ.

Sub-Family 1.—*DANAINÆ*.

A. Vein 10 of the forewing arises from or behind the apex of the cell. The Discoidal vein of the cell of the forewing is so strongly curved that vein 5 arises much nearer to the base than to vein 10. 1. DANAICA. Ltr.



TEXT FIGURE I.

FIG. 1. FIG. 2.

Genus *Amauris*. Genus *Hypolimnas*.

(adapted from *Eltringham*.)

c., Coastal nervure; sc., subcostal, sc. 1, 2, 3, 4, 5, branches of subcostal; ur., upper radial; lr., lower radial; m1, m2, m3, branches of median; sm., submedian; pc., precostal; mdc., middle discocellular; udc., upper discocellular; ldc., lower discocellular; D., discoidal cell; i., internal.

AA. Vein 10 of the forewing arises before the apex of the cell. The Discoidal vein of the cell of the forewing is only feebly incurved so that vein 5 arises not or but little nearer to the base than to vein 10.

a. Vein 7 of the hind wing arises much nearer to 6 than to 8. 2. Amauris. Hbn.

b. Vein 7 of the hind wing arises almost midway between veins 6 and 8. 3. Amaurina. Aurly.

Many authors divide the genus Danaida in different genera, but Aurivillius places them all in one genus and divides them into groups. The species are so few that there seems to be no object in separating the genera for the African forms.*

Group Habits and Characters.

The insects belonging to this group are conspicuously coloured; slow and flaunting in flight and much in evidence during their seasons. The majority of the *Amauris* group are black and white, with a varying amount of ochreous in the hind wing in some species. The *Danaida* are reddish ochre with a varying degree of black and white markings, or black with numerous white or pale blue-green spots, with a certain amount of brownish at the base of the fore and hindwings.

All are known to be distasteful to their natural enemies—birds, mammals, reptiles and even other insects. This fact has been ascertained by experiment and by careful field observations, and would account for their almost total disregard of danger from attack by enemies. Some of them secrete, when handled—a yellowish fluid from the thorax, which has a most disagreeable odour.

The strong influence exercised by the colours and patterns of members of this group, acting through natural selection, has made a deep impression on the colouration and patterns, not only of members of this, but to remarkable degree on susceptible species of widely separated groups. Reference to such mimicry will be made under each species as dealt with.

Many of the species are common and gregarious, not only at sunset when numbers gather together in some sheltered corner preparatory to settling for the night, but also during the heat of mid-day, and when feeding. It is a common sight to see large numbers of *Tirumala* or *Amauris* hovering round the creeper-clad trunk of some large sheltering tree, individuals viing with one another for the possession of some coveted twig or leaflet.

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* Dr. van Someren prefers to recognise the genera *Tirumala* and *Melinda*.

Some individuals are highly aggressive and persistent in their attack and endeavour to dislodge the tenacious occupier of a favourite sleeping site. The usual mode of attack is for the aggressor to launch himself straight at the settled enemy, and then if repeated attempts fail to dislodge him, he settles alongside or even on top of the insect in possession, and by a rapid flapping of the wings, sometimes succeeds in displacing him. More often than not both insects lose a hold on the site and, by the time they have disentangled themselves, they find a third party in possession.

The number to be found over a particular feeding ground depends largely on the presence of some specially attractive food-plant. There are several flowering shrubs and plants frequented by these insects, such as the Wild Heliotrope, the flowers of a creeper, and those of the Cape Chestnut (*Calodendron capensis*) are especially attractive to *Melinda* and *Amauris*.

Members of the genus *Amauris* are attracted to damp mud, and it is a common sight to see dozens or even a couple of hundred feeding on some foul smelling patch of mud, or some evil odoured bait, such as is beloved by the beautiful male Charaxes.

Danaida chrysippus is found most frequently in open " park country " and open grass plains where the foodplants of the larvæ are most in evidence.

Tirumala is also found in such situations but frequents also the open glades and edges of forests. *Melinda* inhabits much the same country but should be considered as more partial to forests.

The species of *Amauris* are to all intents and purposes dwellers in the forest and sparsely forested areas, though one does come across certain species in the open.

A trait peculiar to the whole group is extraordinary longevity and resistance to conditions which would cause death to many more robust looking species. Individual specimens have been noted to live in a wild state for more than a month, while captive specimens, properly fed, have survived considerably longer.

On one occasion, a *Tirumala* which had been put in a cyanide bottle and subsequently papered, arrived three weeks after the date of capture. It was found alive and perfectly vigorous!

Pressure on the thorax which would kill most species appears to incommode these not at all, while fumes from an ordinary Cyanide bottle take a very long time to cause death.

" Shamming death " is practised by all members of this group. If a specimen is captured with one's fingers, it will suddenly cease struggling and remain motionless and if placed on the palm of the hand will lie quiet until all of a sudden it will take wing and make off. Similarly, when a specimen has been caught in a net and the

thorax compressed, it will lie as if dead at the bottom of the net until this has been opened, then out it goes!

Certain butterflies are provided with well marked scent " patches " or " pockets," and in the groups now under consideration these characters are developed to a marked degree.

In the *Danaida* group (including the *Tirumala* and the *Melinda*) these scent organs are developed in the male in the form of a pocket, or pouch, which is placed between veins 1 b. and 2,but nearer the latter, in the hind wing. In *Danaida chrysippus* the organ is a pouched pad which projects to an almost equal degree on the upper and under surface of the wing. In *Tirumala* and *Melinda* it is a pouch or pocket which projects on the under surface and is directed upwards, so as to overlie vein 2. The position of the pocket is indicated on the upper surface of the wing by the presence of a dull spot or mealy patch.—Vide Pl. I, fig. 1—5 and Pl. III., fig. 1—6.

In the *Amauris* group the male scent organ is a thickened dull mealy spot varying in shape in different species, situated near the anal angle and divided by vein 1 b. These spots are of great diagnostic value in determining the position of individuals of this group.—Vide Pls. II., V., X.

All the males of these groups possess a pair of retractile " pencils " or " brushes " which can be extruded from the anal end of the body.—Vide Pl. III., fig. 2. These organs are displayed during the act of courtship, (as described by Carpenter in Proc. Ent. Soc. 1914 p. cxi.) and are used for disseminating a scent calculated to excite the female. These brushes are charged with the secretion from the scent brands. The odour from these brushes is a pungent, disagreeable smell, somewhat like that from Bat droppings. The charging of these brushes has been observed by Lamborn (Proc. Ent. Soc. 1911, p. XLVI., 1912, p. XXXV., and one of us. In both instances the insect observed was *Amauris niavius*. Lamborn describes the act as follows:—" In January of this year I observed a male *A. niavius, L.*, settle on the upper surface of a leaf with its wings expanded. The insect flexed its abdomen, making the dorsal surface convex, so that the extremity of the body was brought level with the brands, and the tufts were then thrust out. By alternately flexing and straightening out of the abdomen the tufts were passed to and fro over the surface of the bands as though some secretion was being conveyed from one to the other."

It is very important that such observations should be recorded, for little is known regarding these things.

D. CHRYSIPPUS. L. Pls. I & III., figs. 1—4.

General colour dull red-ochre, with white-spotted black margins. There are four well marked forms or varieties, with intergrades. The type form has the apical third of the forewing black, with an oblique row of six more-or-less closely connected, somewhat quadrate white spots along its inner edge. (Plate I., fig. 1.). The apical half of this black tip is coloured brown on the undersurface of the wing. The anterior part of the forewing is usually of a darker shade of brown than the rest.

On the hindwing there are three black spots situated at the junctions of veins 4, 5 and 6, with the cell. There is in addition, in the male, a fourth black spot which indicates the position of the sex-pouch.

The second form *dorippus*, Klug, is very similar to the above but lacks entirely the black and white apical markings to the forewing. —Pl. I., fig. 2. Pl. III., fig. 2. Transitional varieties between this form and *chrysippus* are not very common. The usual variety being one in which the row of white spots are clearly indicated.

The third form, *alcippus*, Cr., resembles the type form in the markings of the forewing, but has the greater part of the hindwing white. The black marginal border is retained.—Pl. I., fig. 3, and Pl. III., fig 3.

A fourth form, *albinus*, Lanz., has the forwing as in *dorippus* and the hindwing more as in *alcippus*, though not so white, there being a distinct suffusion of yellow-brown scales between the central white patch and the black border.—Pl. I., fig. 4, and Pl. III., fig. 4.

The sexes are alike in all these forms, except that the male has an extra spot in the hindwing which corresponds to the position of the sex brand, or pocket.

Breeding experiments have shewn that all the above forms are one and the same species.

The species is generally abundant in the open country and woodlands, but is seldom seen in the forests. It flies very slowly and is sluggish in habits. As already mentioned, under group habits, etc., this danaine is known to be highly distasteful. In its various forms it serves as a model for a large number of mimetic species, the most notable being:—Mimics of *chrysippus*=female *Hypolimnas missipus*, *Acræa encedon*, *Mimacræa marshalli*, *Euhpædra eleus* and *ruspina*, *Papilia dardanus* female form *trophonius*, etc. Mimics of form *dorippus Hypolimnas*, female form *inaria*, *Acræa encendon f. daira*, *Acræa johnstoni f. fulvescens*, *Mimacræa marshalli dohertyi*, *Popilio dardanus* female form *dorippoides*, etc.

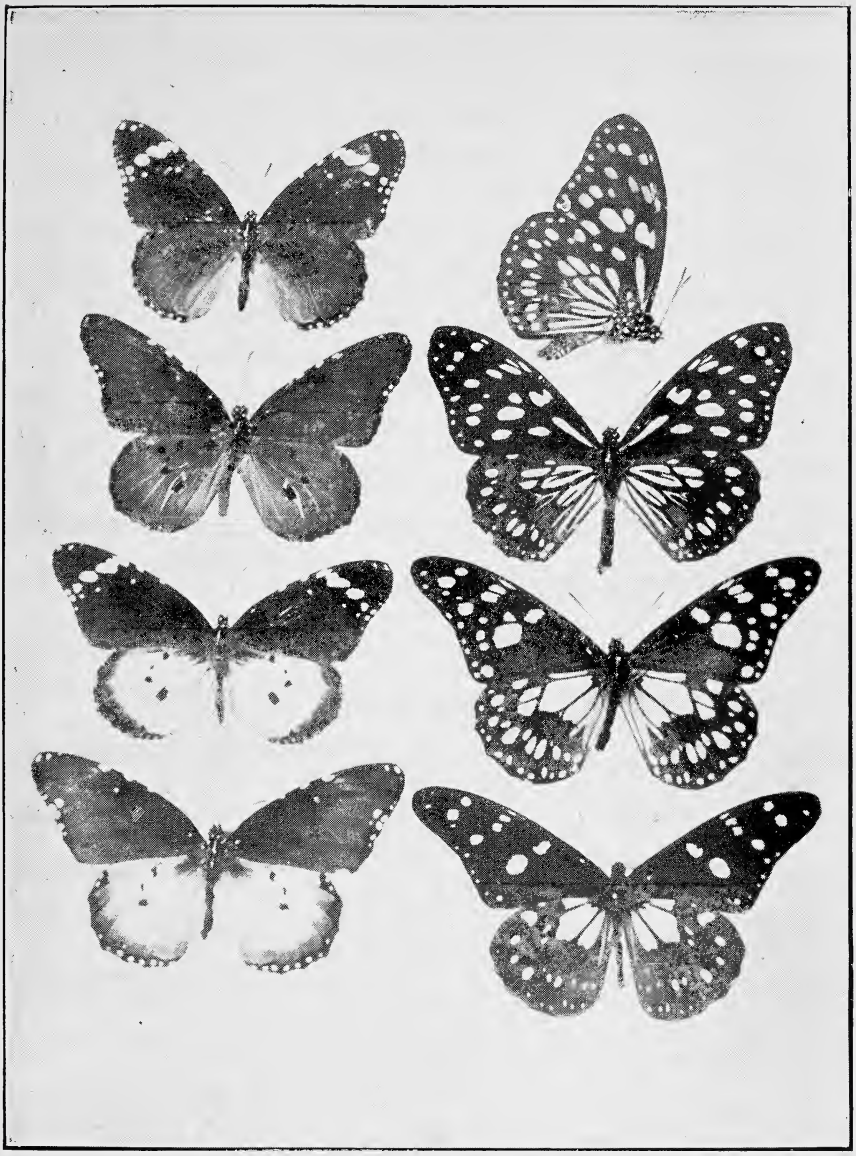


Fig. 1. Danaida chrysippus, L., Jinja. (Female)

Fig. 2. Danaida chrysippus, form dorippus, Klug. Nairobi. (Male)

Fig. 3. Danaida chrysippus, form alcippus, Cr. Jinja. (Male)

Fig 4. Danaida chrysippus, form albinus, Lanz. Nairobi. (Female)

Fig. 5. Tirumala limniace petiverana, Dbl. Hew. undersurface shewing "pocket" on hind wing. (Male)

Fig. 6. ,, ,, ,, ,, Kamoisi. (Male)

Fig. 7. Melinda formosa formosa, Godm. Nairobi. (Male)

Fig. 8. Melinda mercedonia, Karsch, Jinja. (Male)

Distribution :—

The type forms occur at the coast along with the other varieties in lesser degree, *dorippus* far outnumbering all other forms. The prevalent form in Nairobi is the *dorippus* variety—but others occur also. In Kavirondo and Uganda all forms are present, but the *alcippus* and *albinus* varieties are common in this district.

Danaida chrysippus breeds on several kinds of plants, notably, various species of *Asclepias* and *Gomphocarpus fruticosus* and a creeper (un-named).

Early Stages :

The eggs are laid singly on the upper or undersurface of the leaves; occasionaly a single leaf will have four or five eggs scattered here and there. Occasionally the eggs are deposited on vegetation nearby the food plant. In shape the egg is oval, rather pointed at its upper end and slightly flattened at its base. It is longitudinally ribbed and ornamented with ridges between the ribs.—Pl. VI., fig. 1. Larvæ have emerged from eggs, kept under observation, on the third day. They are 3 mm. in length, and of a greyish-brown colour, semi-transparent, with faint indications of cross bars. Growth is very rapid and at the second instar the colour is almost that of the mature larva though the ornamentation is not so pronounced. The adult larva (length 40—50 m.m.) is bluish-grey on the back, finely barred transversely with black; each segment, except the first, dorsally ornamented with two contiguous oval orange or yellow spots. The undersurface of the body is purply-black and separated from the bluish-grey of the upper parts by a somewhat diffuse body or spiracular line. The legs are blackish with a bluish-grey transverse line. The head, which is greyish, has a frontal horse-shoe-shaped line of black. The dorsal surfaces of the 2nd, 5th and 11th segments bear a pair of long black flexible filaments arising from the extremities of the yellow spots. The bases of these filaments are reddish. The anterior pair are the longest.—Pl. VIII., figs. 1—3. Pl. IX. a.

The colour of the larva changes just before pupation; the dorsal yellow marks become less pronounced, while the yellow body-line becomes more distinct and the insect becomes more translucent purplish.

The larva suspends itself by its posterior end and pupates within forty-eight hours. The pupa (Pl. VIII., fig. 4, Pl. IX. a.) is a beautiful object; translucent pale pink or pale green, slightly more opaque in the region of the wing cases, and ornamented dorsally with golden spots at the line of angulation of the abdominal segments.

Faint yellowish dots denote the position of the abdominal spiracles. The pupal period lasts from ten days to three weeks, varying in individual cases.

The larvæ are highly subject to being parasitised by several species of flies. The relative scarcity of the food plant, coupled with the high percentage of mortality due to parasites probably accounts for the control in numbers which undoubtedly exists.

DANAIDA (TIRUMALA) LIMINIACE PETIVERANA, Dbl. & Hew.—Pl. I., figs. 5 and 6.

This species has a blackish ground colour, and light blue-green markings; the forewing has a longitudinal streak at the base of the cell, but the hindwing, deeply cleft basal marks. The cell of the forewing has a transverse spot beyond the middle. Both wings have discal spots and small submarginal spots. The ground colour of the undersurface is lighter, more greyish than the upper, and distinctly brownish over the basal two-thirds of the forewing and at the base of hindwing. The type form is Oriental. The sexes are alike in colour and differ only in size, the females averaging larger.

The flight is slow and weak. When feeding at flowers, the insects keep their wings stationary, and when moving from one bloom to another, theey glide rather than fly. It is found in forest and woodland and is the model for the mimetic Swallowtail, *Papilio leonidas*. In Kenya it is also the possible model of *Euxanthe wakefieldi* and in Uganda of *Euxanthe ansellica*.

Distribution:

The species is common throughout Kenya and Uganda, but is more plentiful in the warmer areas. It is very abundant at the Coast and was seen in large numbers at Marsabit.

Early Stages:

The eggs, which are pale creamy white are laid on the undersurface of the leaves of a creeper (un-named). They are long oval, with longitudinal ribs and transverse ridges.

The larva from the second instar is whitish with narrow brownish transverse lines, each segment with a broad white band at its anterior edge. The legs are blackish, each with a couple of large white spots at their bases. The head is black, ornamented with a white trident. There are two pairs of fleshy filaments, placed on the 3rd and 11th segments, dorsally, as in *D. chrysippus*.—Pl. VIII., fig. 8—9.

The pupa is a pale semi-translucent green, similar in shape to that of other *danaina* chrysallises, but rather more angled dorsally. It is decorated along the line of the abdominal angle with golden spots and ornamented with spots of the same colour on the dorso-thoracic ridge, the wing cases and the head case.—Pl. VIII., fig. 10. When the butterfly has emerged, the pupal case is clear and transparent like glass.

DANAIDA (*MELINDA*) *FORMOSA*, Gd.—Pl. I., fig. 7 and Pl. III., 5.

In general scheme of pattern, this species resembles somewhat, the preceding. It differs, however, in having a large, pale, bluish-cream basal area in the hind wing, traversed by dark veins; and in having the basal part of the forewing, to almost the middle, and the costa of the hind wing, bright orange-brown. The spotting on the fore and hind wing is larger. The dark markings on the undersurface are more brownish than blackish. The forewings are rather long and tapering in the male, less so in the female. The sexes are coloured alike execpt that in most females the brown patch on the forewing is paler. Some females however have the whole of the pale patch in the hindwing broadly outlined with orange-brown. In some examples the pale spot in the forewing cell is entirely wanting.

The habit of *M. formosa* are typically *danaine;* the flight is a slow sailing and gliding movement, though when the insect is disturbed, it has a remarkable turn of speed. It is a conspicuous object when flying, or when settled on some flowering plant. When actually feeding at a flower it hangs down with motionless wings (this in distincton to the method of feeding of *Papilio rex rex*, its wonderful mimic, which generally flaps its wings at such times). We have occasionally taken males at damp mud, but they do not appear to be particularly partial to such.

Distribution:

The species has a somewhat restricted distribution, extending from the Taita country northward to North Kavirondo where its meets with and slightly overlaps the next species, *M. mercedonia*. It is common throughout its range.

Early Stages:

Melinda formosa has been found laying on two species of fine-leaved creeper (as yet unidentified) both of which are fairly common in the forests round Nairobi. The eggs are laid singly, preferably on the young tender straggling shoots. They are creamy white with a glazed surface, decorated with longitudinal ribs arising

from a common point, at the apex of a long oval. There are numerous transverse ridges between the ribs.

When the larvæ are first hatched they are creamy or dirty whitish but develop into striking creatures at the second and third moult. An adult larva is a delicate pale bluish on the dorsum, with a lateral line of crimson, followed by a bluish spiracular line. Each spiracle is surrounded by a yellowish area. The undersurface of the body is greenish, separated from the spiracular line by a narrow bordering of crimson. The legs are blackish, ornamented on the outer surface with crimson. The dorsum of the caterpillar is ornamented with four pairs of very long fleshy filaments, situated on the 2nd, 3rd, 5th and 11th segments. These are crimson. There is a certain degree of variation in the colour of the larvæ in the last instar; thus certain individuals are less bluish than normal, but are, however, distinctly barred transversely with brownish. These lack entirely the first lateral body-line and instead have an extension of the yellow surrounding the spiracles in the form of a wide lateral stripe. The fleshy spines are pinkish. The underside of the body is brownish yellow and the suctorial legs are ornamented with white marks.—Pl. VIII., fig. 5 and 6 and Pl. IX. (b.). The head is black with central and lateral white lines.

The pupa, which is suspended by a well-formed black cremaster, is pale translucent green ornamented dorsally with a row of golden spots at the abdominal angle, and decorated on the dorsum and lateral surfaces of the thorax with golden spots of varying shape and size. When the butterfly is nearly ready to emerge, the pupa darkens generally, but the first colour to show up is the orange-brown of the base of the forewing. When the insect has emerged the pupal case looks like clear glass.

DANAIDA (MELINDA) MERCEDONIA. Karsch.—Pl. I., fig. 8.

Pl. III., fig. 6.

In this species the spotting of the fore and hind wings is greatly reduced, and resembles, so far as the forewing, that seen in the Amauris group. The base of the forewing and the whole of the hindwing, except for the spots, is a rich chestnut-brown, deepening in the latter, at the margins, to blackish-brown, and in the former to rich black-brown for the terminal two-thirds. The pale spots in the forewing have a bluish tinge while those in the hindwing are creamy with a greenish tinge. The submarginal spots of both wings are greatly reduced. The sex spot in the male is very conspicuous. The forewings in both male and female are narrow and abruptly graduated, though not so much in the latter sex.

The males predominate undoubtedly, but on the other hand, the females are more retiring and keep to the thicker forest and are easily overlooked. Males are frequently seen feeding on damp mud.

Distribution:

This species is found throughout Uganda and inland east to Elgon and Nandi.

Early Stages:

Melinda mercedonia appears to resemble *M. formosa* in habits of flight and feeding, and in regard to the egg and larva; this last, however is unknown to us in the mature stage. The pupa is similar in shape to that of *M. formosa*, but is less ornamented. The line of abdominal spiracles is conspicuous.

This species is the model of the mimetic Swallowtail *Papilio rex mimeticus*. It is highly distasteful and is almost immune to attack from insectivorous birds, etc.

Genus *AMAURIS*. Hbn.

This genus is peculiar to the Ethopian region but extends to Madagascar, and the neighbouring islands. It is represented within the countries dealt with in this paper by sixteen species and races.

(For general notes on the group see introductory remarks on page 23.)

AMAURIS NIAVIUS NIAVIUS. L.

AMAURIS NIAVIUS DOMINICANUS, Trimen.

(Pl. II., figs. 1 and 2. Pl. III., figs. 8 and 9).

This is a large conspicuous black and white species which extends from the coast to western Uganda. There are two well-marked geographical races.

The type form is a beautiful intense black in the forewings and sooty brown-black in the hindwings. The forewings have large white spots towards the base on the lower edge, continuous in outline with larger white spots in the hind wing. The hindwing spot extends from the base to the apex of the cell. In addition to the spot on the forewing, there is a wide white subapical band; an oblique white line in the cell; two subcostal spots; and five submargnal spots in internervular spaces 1, 2, 3, 6 and 7. The hindwing has no submarginal spots.

The race *A. n. dominicanus* differs from the type form in the much larger white patch of the hindwing and the wider subapical bar in the forewing. On the undersurface of both races, the dark areas are brownish black in the forewing, while in the hindwing the whole surface is white-scaled except at the extreme base and the outer margin. The internervular rays are blackish and stand out against the whitish ground. The sex mark in the male is a dull oval spot on vein Ib.

Distribution:

This type form is found throughout Uganda east to Mt. Elgon. The race *dominicanus* extends from the Coast to Mt. Kenia and Marsabit and on to Elgon—in which area it interbreeds with the typical form producing intermediates.

Early Stages:

The early stages of this insect are unknown to us.

This species has impressed its colouration on many highly susceptible butterflies including *Papilo dardanus*, female form

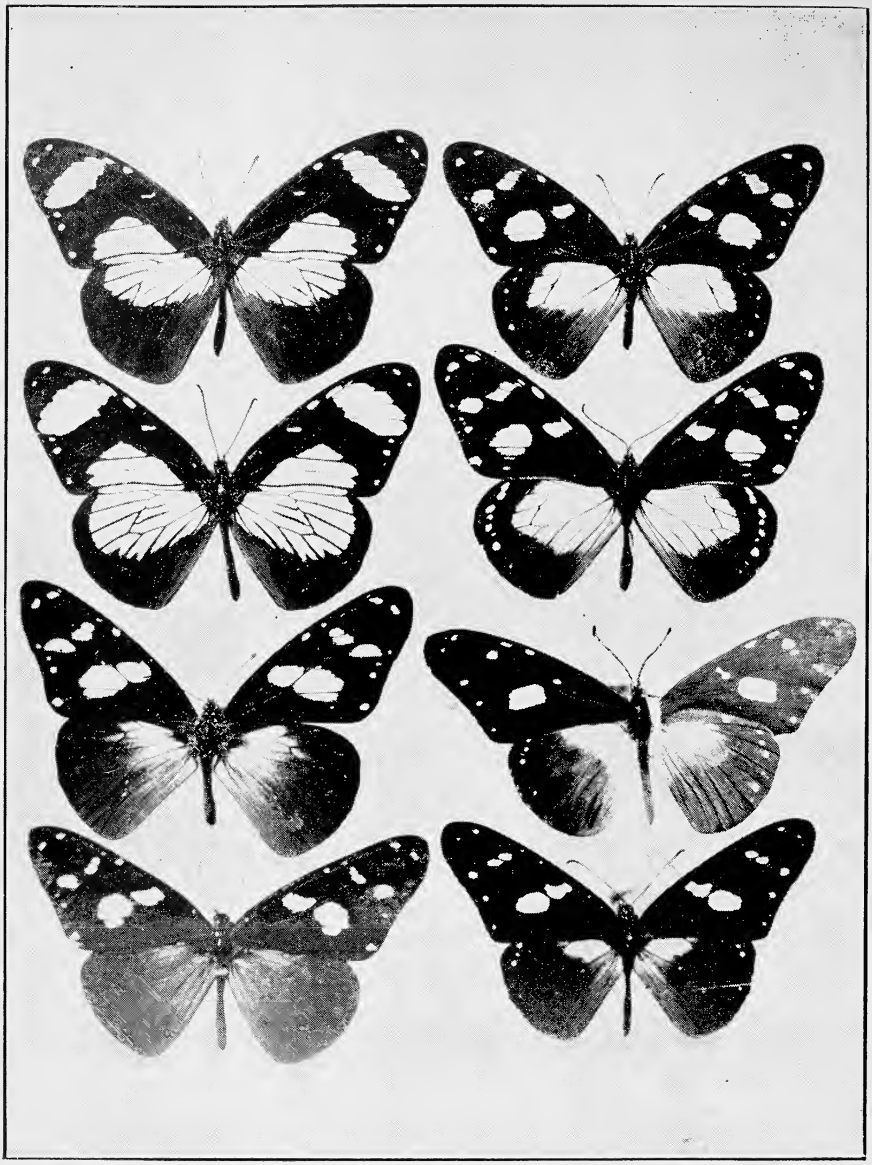


Fig. 1. Amauris niavius niavius, L. Mawokota. (Male)

Fig. 2. Amauris niavius dominicanus, Trimen. Mombasa. (Male)

Fig. 3. Amauris damocles damocles, Beauv. Mawokota. (Male)

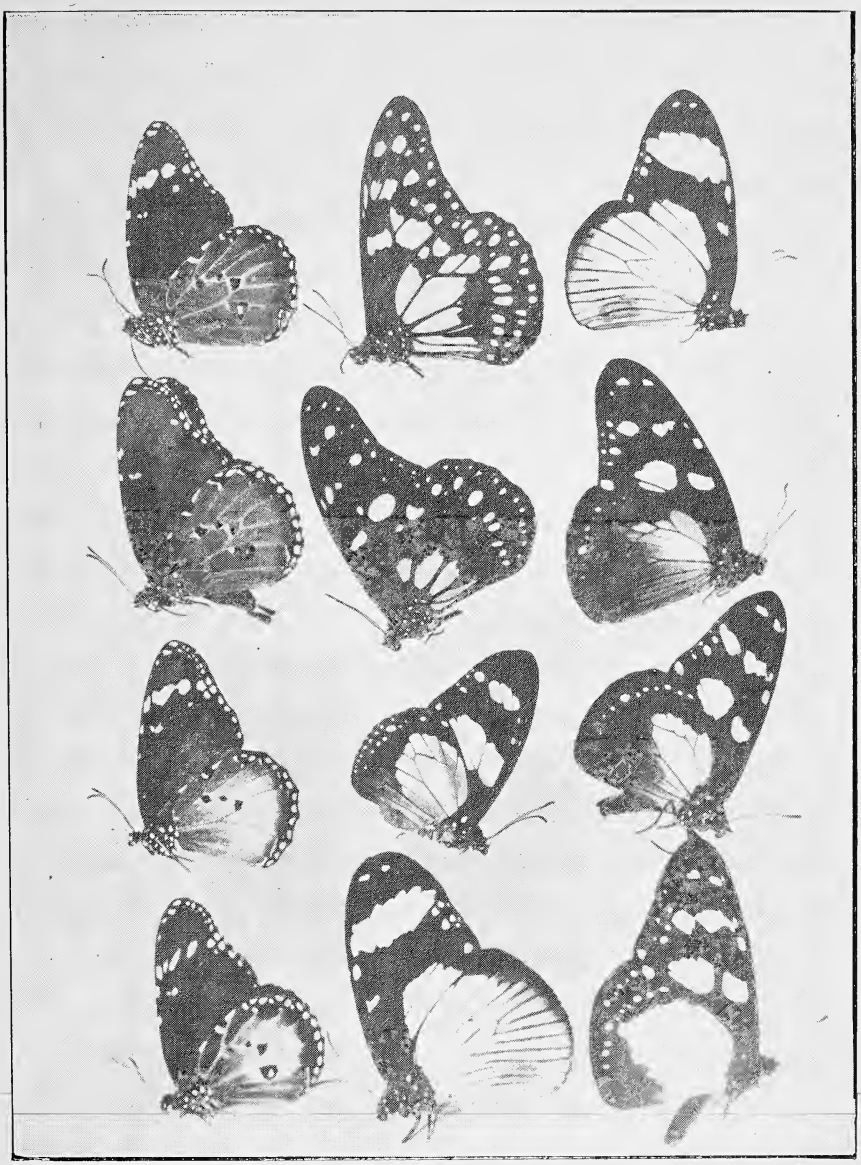
Fig. 4. Amauris damocles ab. Toro. (Male)

Fig. 5. Amauris damocles f. psyttalea, Plötz. Jinja. (Male)

Fig. 6. Amauris damocles damoclides, Slgr. Kaimosi. (Male)

Fig. 7. Amauris dira, Neave. Teriki. (Male)

Fig. 8. Amauris hecate, Btlr. Mulange. (Male)



Under surfaces of Danaines, shewing "pockets" and Sex Brands.

Fig. 1. Danaida chrysippus, L. Mulange.

Fig. 2. Danaida chrysippus f. dorippus, Klug. Nairobi. shewing "Brushes" extruded.

Fig. 3. Danaida chrysippus f. alcippus, Cr. Jinja.

Fig. 4. Danaida chrysippus f. albinus, Lanz. Jinja.

Fig. 5. Melinda formosa, Godm., Kaimosi.

Fig. 6. Melinda mercedonia, Karsch. Jinja.

Fig. 7. Amauris ochlea Bdv., Samburu.

Fig. 8. Amauris niavius niavius, L. Jinja.

Fig. 9. Amauris niavius dominicanus, Trimen, Mombasa.

Fig. 10. Amauris damocles, Beauv. Jinja

Fig. 11. Amauris damocles psyttalea, Plötz. Mulange.

Fig. 12. Amauris damocles damoclides, Stgr. Kaimosi.

hippocoon, *Hypolimnas dubius f. wahlbergi*, *H. anthedon*, *Hypolimnas usambara*, etc. (For further information see Jrl. Nat. Hist. Soc., Vol. No. 2, p.p. 81—92).

AMAURIS OCHLEA, Boisdv.—Pl. V., fig. 1., Pl. III., fig. 7.

A small black and white species, with black, white-spotted fringes. The forewing has a large, oblique, irregular patch extending from the subcostal nervure to the submedian or vein i. near the base of the wing. At the extremity of the cell, but above the subcostal nervure, there is a small spot and a still smaller one beyond. An oblique subapical bar of three confluent spots crosses the end of the wing. There are four submarginal spots.

The hindwing has a very large white patch covering nearly the whole of the wing, while in cellules 4, 6 and 7 are small submarginal white dots.

The male sex brand is a long ovoid patch at the anal angle of the hindwing, divided by vein Ib.

Distribution:

This species is very common at the coast but extends to Kibwezi, and along the Tana River, and has been taken in the Southern Masai Reserve. It is not very common in Taita.

Early Stages:

The egg is a creamy white long oval, pointed at the upper end and ornamented throughout its length with longitudinal ribs, between which are numerous transverse ridges. The eggs are laid on Tylophora anomala and Cynchum chirindense and on a creeper as yet unidentified.

This species is the model for *Hypolimnus deceptor*, *Pseudacraea l. expansa*, and possibly the female of *Euxanthe wakefieldi* and *E. tiberius*.

AMAURIS DAMOCLES DAMOCLES, Beauv.—Pl. II., fig. 3 and Pl. III., fig. 10.

AMAURIS DAMOCLES F. PSYTTALEA, Plotz.—Pl. II., fig. 5 and Pl. III., fig. 11.

AMAURIS DAMOCLES F. DAMOCLIDES, Stgr.—Pl. II., fig. 6 and Pl. III., fig. 12.

AMAURIS DAMOCLES, ab.—Pl. II., fig. 4.

A. damocles in its various forms is a large black and white species extending from the Kilimanjaro area to Uganda, but not extending into Kenya except along the Tanganyika border and in the Elgon Nandi region. In the type form, the basal white patch of the hindwing does not extend much beyond the middle of the cell and never reaches the apex. The large spot in the forewing cell is continuous with that in cellule 2, this latter extending into 1.

The discal spot in cellule 3 is larger than those in 4 and 5. There are a few submarginal spots on the forewing but none on the hindwing. The sex spot is a small oval divided by Ib.

The sexes are alike, though many specimens from the Sesse Isles have a decidedly ochreous tint to the hindwing patch; thus approaching *A. grogani* in colour.

Fig. 4 of Plate 2 is a very dark variety which is very like *Amauris tartarea*, Mab. There is a reduction in size of the spots and an almost entire absence of whitish scales at the base of the hind wing. Both forms occur in Uganda to Elgon and Kaimosi.

The form *psyttalea*, Plotz., differs from the type form in a reduction of the spot in the forewing cell, but an increase in size of the hindwing patch to the apex of the cell: the margins being well defined. A further difference is the presence of submarginal spots on the hindwing.—Fig. 5, Plate 2.

The form *damoclides*, Stgr., is the extreme form exhibiting an increase in size and number of the submarginal spots on both fore and hindwings and an enlargement of the hindwing patch to well beyond the apex of the cell.—Fig. 6, Pl. 2.

The sex patch in all the forms is a dark dull area at the anal angle of the hind wing on vein Ib.

The undersurfaces of the wings are browner than the uppers but otherwise similar except in the race *damocles* which has a row of distinct submarginal pale spots on the undersurface of the hindwing, which are not visible on the upperside.

DISTRIBUTION:

The range of *Amauris damocles* would be Kilimanjaro to Victoria Nyanza and Western Kenya and throughout Uganda.

EARLY STAGES:

The egg of this species is a pointed oval with wide ridges and narrow grooves. The ridges being indistinctly barred transversely. The mature larva and the pupa are unknown to us.

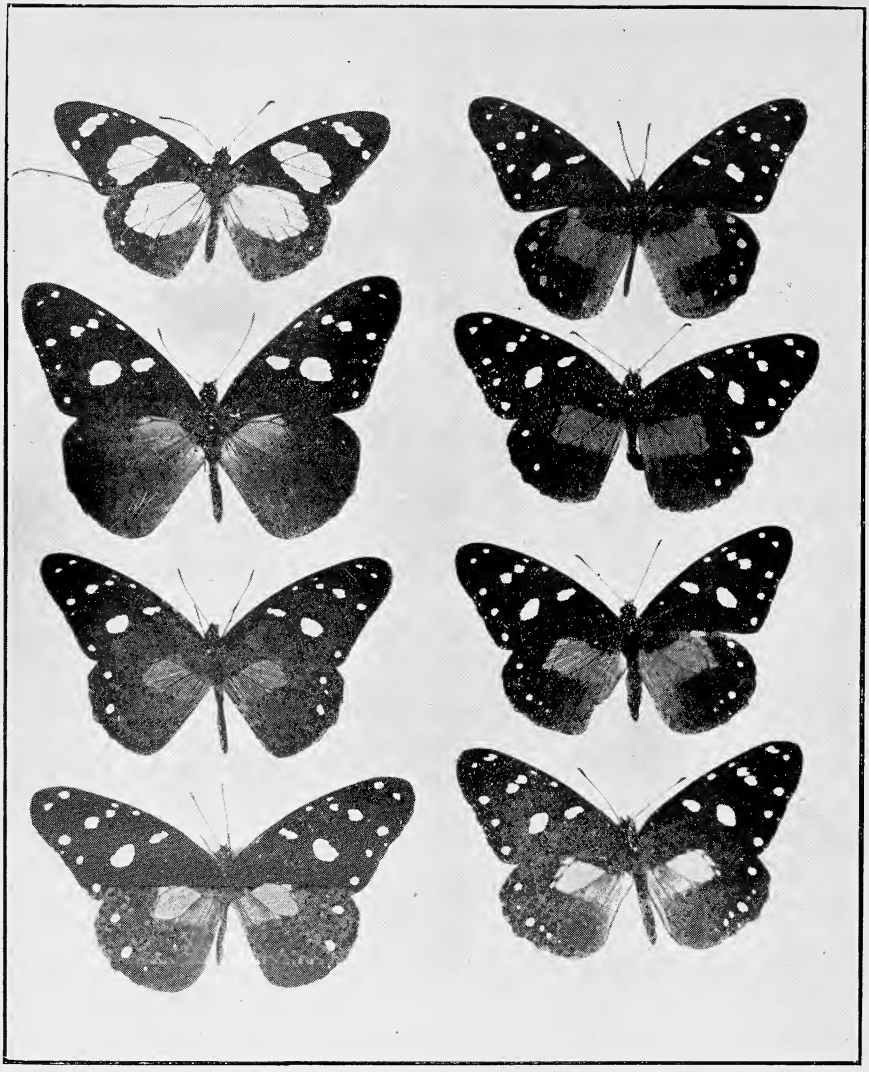


Fig. 1. Amauris ochlea, Bdv. Mombasa.

Fig. 2. Amauris grogani, E. Sharpe. Jinja.

Fig. 3. Amauris oscarus, Thurau. Jinja. (Male)

Fig. 4. Amauris oscarus, Thurau, Mawokota. (Female)

Fig. 5. Amauris echeria jacksoni, E. Sharpe. Terika.

Fig. 6. Amauris albimaculata, Btlr. Nairobi. (Male)

Fig. 7. Amauris albimaculata, Btlr. Nairobi. (Female)

Fig. 8. Amauris albimaculata hanningtoni, Btlr. Taita.

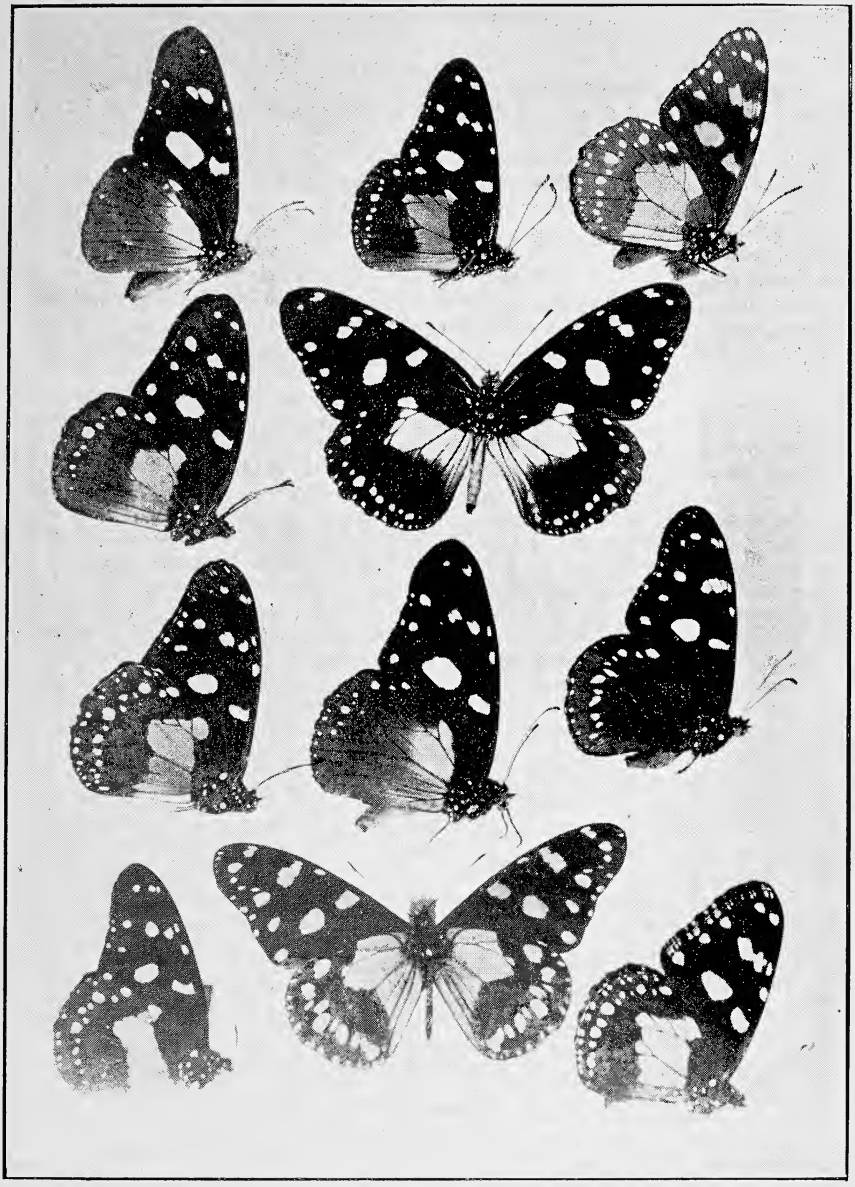


Fig. 1. Amauris hecate, Btlr. Jinja.

Fig. 2. Amauris oscarus, Thurau. Jinja.

Fig. 3. Amauris echeria jacksoni. E. Sharpe. Jinja.

Fig. 4. Amauris echeria. Under surfaces Amauris.

Fig. 5. Amauris albimaculata albimaculata, Btlr. Jinja.

Fig. 6. Amauris albimaculata hanningtoni, Btlr. Taita.

Fig. 7. Amauris grogani, E. Sharpe. Jinja.

Fig. 8. Amauris ellioti. Btlr. Kigezi.

Fig. 9. Amauris lobengula septentrionis, Poulton. Marsabit

Fig. 10. Amauris ansorgei, E. Sharpe. Lumbwa.

Fig. 11. Amauris albimaculata hanningtoni, Btlr. Kibwezi.

AMAURIS DIRA, Neave.—Pl. II., fig. 7. (Upper and under surfaces).

This species is apparently rare, or has been overlooked by collectors. It is at present known only from the type and one other specimen. As there are no specimens before us, the original description is given. General colour glossy black with white spots. Forewing: In discoidal cell placed a little beyond the middle and nearer the posterior border, a very small spot. Below cell, between the first and second median nervules, both of which bound it, is a large rectangular spot. This is by far the largest and most striking spot in the wing. At the extremity of the cell and above it is a small spot. Just beyond this and beneath the costa, is another spot, rather long and narrow. This spot is the first of a row of four spots which cross obliquely the apical portion of wing to distal margin. Of this row, the second is the largest, and the third, which is somewhat indefinite and may be evanescent, is close to it. The fourth is close to the distal margin and lies just under the third radial nervule. Near the apex are two small white spots, of which the one nearest the costa is the larger. There are also near the distal margin two more spots placed beneath the second and the first median nervules respectively. There are two or three minute evanescent spots close to the distal margin about its middle. Fringe black, with small white internervular patches throughout the middle of the distal margin. Hindwing paler in colour than forewing. Crossing the cell near but not quite up to its base is a whitish patch; beginnng at the anterior border of the cell, it extends across its posterior border to the inner angle of the wing. In breadth it extends rather beyond half the length of the cell. Just below costa, beyond extremity of the cell, is a spot, and there are three more small spots at the beginning of and following the course of the distal margin. There is also a fourth sometimes indefinite spot near the distal margin just beneath the third radial nervule. Fringe as in upper wing. The underside is very much as upperside, except that apex of forewing is paler and all spots are more pronounced. The spot in the forewing cell has a projection extending towards the costa. In the hindwing traces of more spots appear.—Fig. 7, Pl. II. (this figure is taken from Novit. Zool. Vol. XI., 1904, Pl. 1).

Distribution:

Teriki, Kaimosi, N. Kavirondo.

Early Stages:

Nothing is known of the early stages of this insect.

The sex patch is well marked, consisting of two long streaks on either side of vein Ib. at the anal angle.

AMAURIS HECATE, Butl., Pl. II., fig. 8. Pl. IV., fig. 1.

This species is extremely like the foregoing but may at once be distinguished by the presence of a large white spot in the forewing cell, touching or not far removed from that in cellule 2. The costal spots of the forewing are reduced in size. There is an additional spot in cellule 4.

The basal patch in the hindwing is small and does not extend beyond the middle of the cell.

This is a very dark species with narrow forewings and only slightly curved margins to the hindwings. The wing-fringes are white-spotted. The undersurface is browner than above.

The sex brands are very large elongate spots on vein Ib., reaching almost to the hind margin. The sexes are alike.

DISTRIBUTION:

Amauris hecate has a restricted range extending from the Kaimosi district, west to Toro in Uganda, and is found in forests.

EARLY STAGES:

The early stages are unknown.

AMAURIS GROGANI, E. Sharpe. Pl. V., fig. 2. Pl. IV., fig. 7.

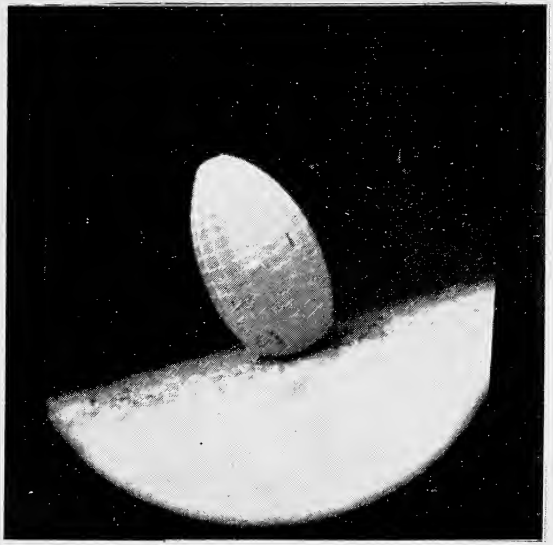
This species resembles somewhat *A. hecate* and *A. dira* in so far as the spotting of the forewing and would appear to be a link between the *A. damocles* group and the *echeria* or *albimaculata* section.

The single spot in the cell of the forewing is large and rounded while that in cellule 2 is also round, but larger. There are two costal streaks and sub-marginal spots as in *A. dira* and in addition, a few marginal spots. In the hindwing there is a basal ochreous patch which extends to about the middle of the cell. The hind margin of this patch is markedly diffuse or dyslegnic (in contradistinction to the clear-cut patch in most others of this group).

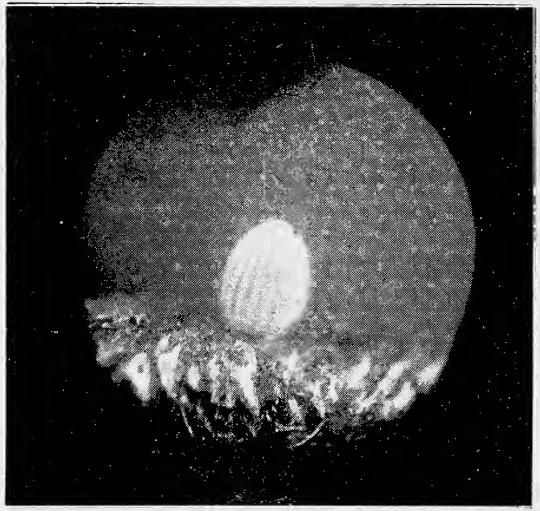
The submarginal spots in the hindwing are variable, but that in cellule 6 is constant (though varying in size); the others usually present are in cellule 4 and 7. On the undersurface of the wings, which is brownish black, the marginal and submarginal spots are more numerous, and very distinct.

The sex brand is very distinct and having a somewhat glazed surface stands out well from the dull brown of the ground colour.

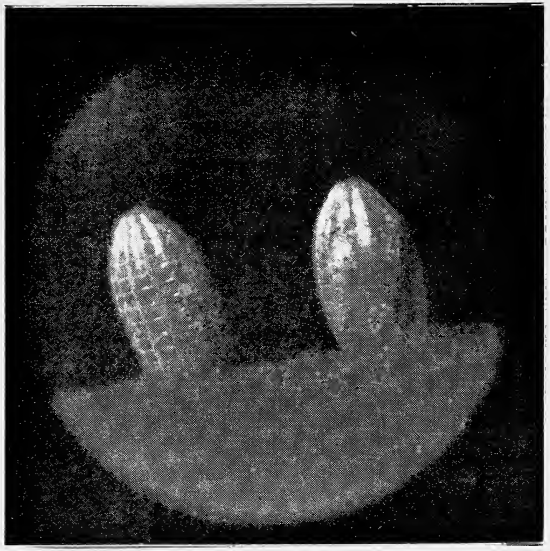
The relationship of this insect is at present obscure. Talbot redescribed it as a race of *A. egialea* under the name *similis*, but we understand that Dr. Jordan thinks it may be a race of *A. inferna*, Butl.



Egg of Amauris oscarus.
X 20.



Egg of Danaida chrysippus.
X 20.



Egg of Amauris damocles.
X 20.

Egg of Amauris albimaculata.
X 20.

Distribution:

The distribution is from Teriki in North Kavirondo to west Uganda and Lake Kivù. It is a forest species.

Early Stages:

Nothing is known of its early stages.

AMAURIS OSCARUS, Thurau. Pl. V., fig. 3 and 4. Pl. IV., fig. 2.

This species has a strong superficial resemblance to *A. echeria* and *A. albimaculata*. The essential features are as follows:—The hindwing patch is narrow, the whole being limited on its lower edge by a line drawn from the origin of vein 5 to the starting point of 2; on its outer margin from vein 5 to just beyond the origin of 7, and thence extended up to 8. The hindwing above has only three submarginal spots, and the submarginal spot in cellule 8 in the forewing is wanting.

The forewing spotting is reminescent of that in *A. dira* but is at once differentiated by the presence of the discal spot in cellule 4.

In female specimens there is an extra submarginal spot in cellule 2. The hindwing patch is also slightly larger and paler. The hind margin of the patch in both sexes is somewhat dyslegnic.

A. oscarus has the undersurface of the abdomen dark, and not whitish as in *A. albimaculata*, and thus resembles *A. echeria* in this respect. The base of the hindwing is dark sooty brown.

The sex brand is a small dark dull oval spot.

Distribution:

The distribution would appear to be Uganda, from Toro east to Mt. Elgon and Teriki.

Aurivillius in Seitz places *oscarus* as a race of *echeria*, but this cannot be correct as the race *A. e. jacksoni* is present in Uganda.

Early Stages:

We have no information on the eggs or larvæ of this species.

This species is one of the group models for *Papilio ugandae*. *P. homeyeri*, *P. jacksoni*, *P. echerioides*, *P. dardanus f. f. cenea*, etc.

AMAURIS ECHERIA JACKSONI, E. Sharpe.—Pl. V., fig. 5. Pl. IV., fig. 3 and 4.

This race differs from the type form in having the forewing spots pure white, not ochreus. The hindwing spots and patch markedly ochreus, the latter sharply defined. The spot in the forewing cell is an oblique bar; that in cellule 2 (discal) somewhat quadrate or

ovoid; those in 4 and 5 rounded. There are three round submarginal spots in cellules 1, 2 and 3.

The hindwing submarginal spots are numerous; there being two spots in each cellule from 2 to 5; the upper ones in 4, 6 and 7 being the largest. The base of the hindwing below is decidedly rufescent-brown. The sex brand is a fairly large dull oval. The white mark on the palp is round.

The underside of the abdomen is dark, not light as in *A. albimaculata*.

DISTRIBUTION:

The distribution is from the Sokoke Forest and Taita hills north to Nandi and Uganda and eastward to Mt. Kenya. It is distinctly uncommon at Taita and very scarce in the highland area of Kenya.

EARLY STAGES:

The eggs of this species are long oval, slightly more pointed at the upper end, and ornamented with longitudial ribs and transverse ridges. The food plant is Tylophora anomala, and an unnamed creeper.

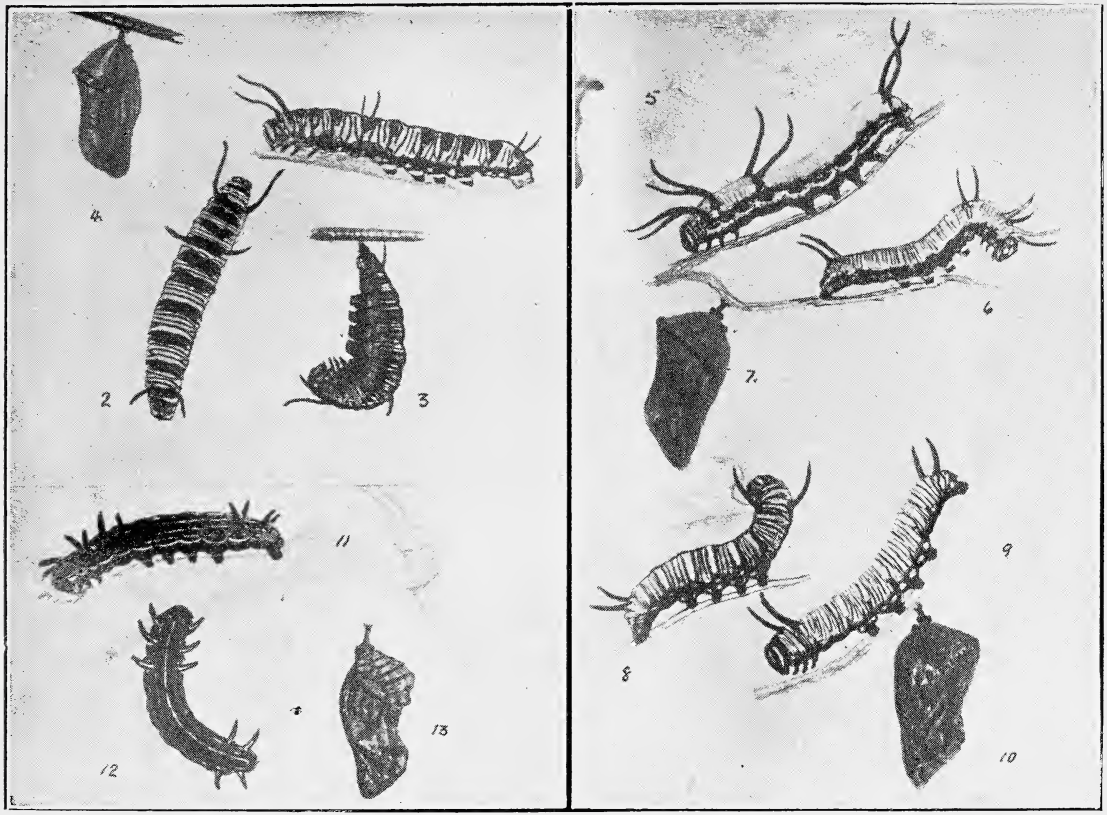
The mature larva is black with longitudinal narrow blue and orange stripes. There are five pairs of fleshy short black subdorsal filaments placed on the 2nd, 3rd, 5th 11th and 12th segments respectively. The pupa is greenish, semitranslucent, markedly convex in the region of the mid-abdominal segments and of the thorax and slightly so over the wingcases; the dorsothoracic junction is very concave; the wing cases and thorax are ornamented with golden spots.—Pl. VIII., fig. 11, 12, 13.

AMAURIS ALBIMACULATA ALBIMACULATA, Butlr.—Pl. V., fig. 6, 7, Pl. IV., fig. 5.

This species is very like the preceding; the spots in the forewing are similarly placed, but are on the whole slightly larger.

The main points of difference are: the white mark on the palp is a long streak; the sex brand is a very large oval, reaching almost to the margin of the anal angle; the underside of the abdomen is whitish contrasting with the dark upperside; the spots on the hindwing are white. The hindwing patch is ochreus.

* Specimens from this locality are near the race *jacksoni* but are not typical.



1— 4. Larve and pupa of Danaida chrysippus.
5— 7. Larvae and pupa Melinda formosa.
8—10. Larvae and pupa of Tirumala petiverana.
11—13. Larvae and pupa of Amauris echeria jacksoni.

A.

Larvae and pupa of Danaida chrysippus on food plant.

B.

Larvae and pupa of Melinda formosa.

AMAURIS ALBIMACULATA HANNINGTONI, Butlr.—Pl. V., fig. 8. Pl. IV., figs. 6 and 11.

This insect has been described as a race of *albimaculata*, the main features being the very pale creamy hindwing patch and the often numerous spots in the hindwing.

This is the predominant form in the Kilimanjaro Taita area, extending north to Lake Victoria. The majority of the Nairobi specimens, however, are considerably darker; while those of the Mau to Nandi and Uganda are even darker, influenced presumably by the dark species, *A. ansorgei*. Certain examples from Nairobi are equally dark. Examples from Uganda are markedly paler than specimens from Kaimosi and Nandi, but they also differ as markedly from Kilimanjaro examples being less whitish.

Distribution:

This species in its various forms extends from the coast, where it is rare, through Kenya to Elgon and Western Uganda.

Early Stages:

The egg of both forms is a long oval, slightly more pointed at the upper end, decidedly ribbed longitudinally, these ribs projecting slightly at the upper disc, and traversely ornamented with close ridges. —Pl. VII., fig. 2. The mature larva is blackish with two orange stripes extending the length of the body. A narrow white central stripe divides the dorsal black line, while a similar line runs along the sides of the body just below the level of the spiracles. The feet are black. The two orange stripes of the body are connected at the middle of each segment by a narrow orange lne.

The insect is ornamented with five pairs of short, fleshy filaments middle of each segment by a narrow orange line.

figs. 14 and 15.

The shape of the pupa is like that of the preceding species but is more ornamented. The dorsal aspect of each abdominal segment is golden, outlined with greenish. The thorax has a large golden spot on each side, on a waxy green ground.. The wingcases are translucent green with two large basal golden patches and four longitudinal lines and one transverse patch over the rest of the wing shields. Just before the insect emerges the green of the pupa is replaced by jet black from which ground-colour the golden spots and lines show up distinctly.

AMAURIS LOBENGULA SEPTENTRIONIS, Poulton.—Pl. X., figs. 1 and 2. Pl. IV., fig. 9.

This insect is remarkable in being a race of a species which until recently was not known to extend beyond southern Taganyika Territory and Nyasaland. This form differs from other named races in having all the spots dark ochreus in colour. The subapical series of spots in the forewing forms a nearly continuous bar with the submarginal spot instead of being separated from it by a wide interval.

The general ground colour is a brownish black in both fore and hind wings, and the pale hindwing patch is very wide.

The sexes are very alike, the female being perhaps a trifle paler in ground colour and having more marginal spots but otherwise very like the male.

Distribution:

So far the only district from which we have taken this insect is the isolated forests of Marsabit.

A. l. septentrionis is the model for a remarkable form of female of *Papilio dardanus*, named *ochracea* by Prof. Poulton, in which all the pale markings are ochreus as in the *Amauris*.

Nothing is known of the early stages of this insect.

Early Stages:

AMAURIS (AMAURINA) ANSORGEI, E. Sharpe.—Pl. X., fig. 3, Pl. IV., fig. 10.

This very distinct species can readily be recognised by its curious colouration. The spots in the forewing being pure white on a very black ground, while those of the hindwing, including the basal patch, are deep chestnut brown. Further, the three subapical spots are closely placed so as to form a bar. The submarginal spots in the hindwing are so dark as to hardly shew up against the dark ground colour.

This curious species with its very dark hindwing appears to have influenced the colour of other *amauris* in the area of its distribution. (Vide Poulton Proc. Ent. Soc. 1924, p. xxix.-xxxi.)

Fig. 1. Amauris lobengula septentrionis, Poulton. Marsabit. (Male)

Fig. 2. Amauris lobengula septentrionis, Poulton. Marsabit. (Female)

Fig. 3. Amauris ansorgei, E. Sharpe. Lumbwa. (Male)

Fig. 4. Amauris ellioti, Btlr. Kigezi. (Male)

Distribution:

The species is common west of the Mau and has apparently influenced the colour of *A. echeria* and *A. albimaculata* in this district.

A single specimen was captured in Nairobi; this is not quite typical, as the hindwing patch and submarginal spots are decidedly paler than normal.

Early Stages:

We have no records regarding the egg or larvæ of this species.

AMAURIS (*AMAURINA*) *ELLIOTI*, *Butl.*—Pl. X., fig. 4, Pl. IV., fig. 8.

General colour deep brownish black with all spots a rich ochreus. The hindwing patch extends to the base of the wing, but does not reach the apex of the cell.

The forewing has a transverse spot in the cell which is separate from the large spot in cellule 2; and there is a subapical bar of four spots in cellules 4—6 and 9. The submarginal spots are well developed in both wings, especially so in the hind. The marginal spots are also large in the hindwing.

Distribution:

The species occurs in the western Province of Uganda from Kigezi to Ruwenzori.

Early Stages.

The early stages are unknown to us.

It would be of the greatest interest to ascertain whether this decidedly marked species has influenced the colours of others of this group or of the *Papilios* in the district..

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OF THE

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JUNE 1925 NO. 22

CONTENTS.

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Dr. V. G. L. van Someren.

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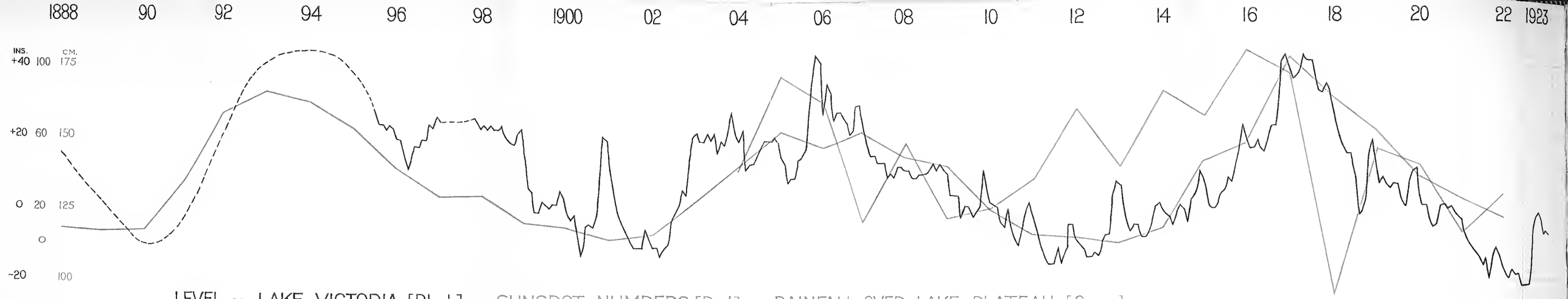
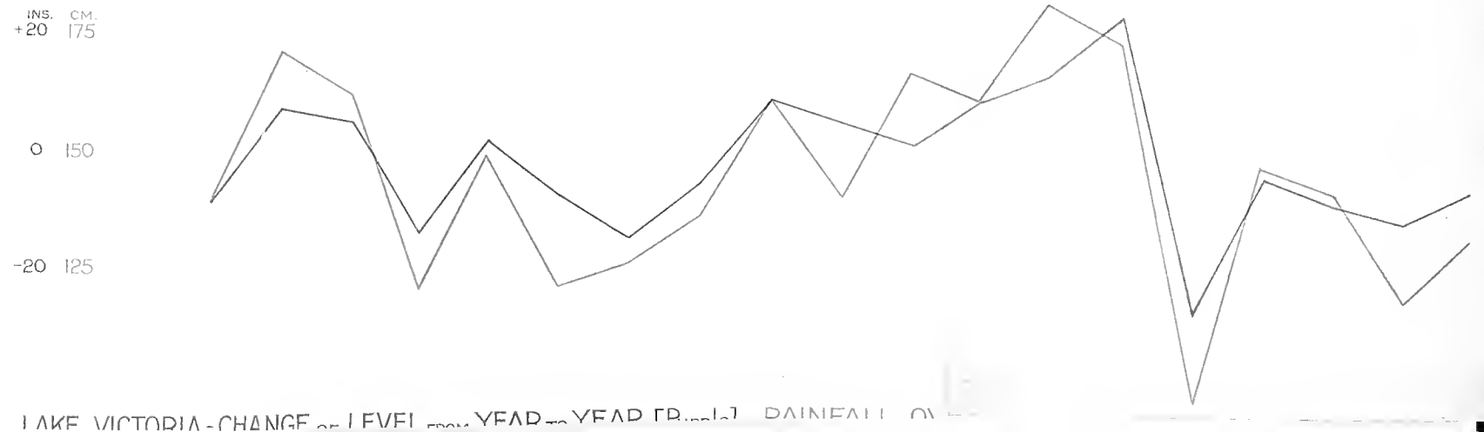
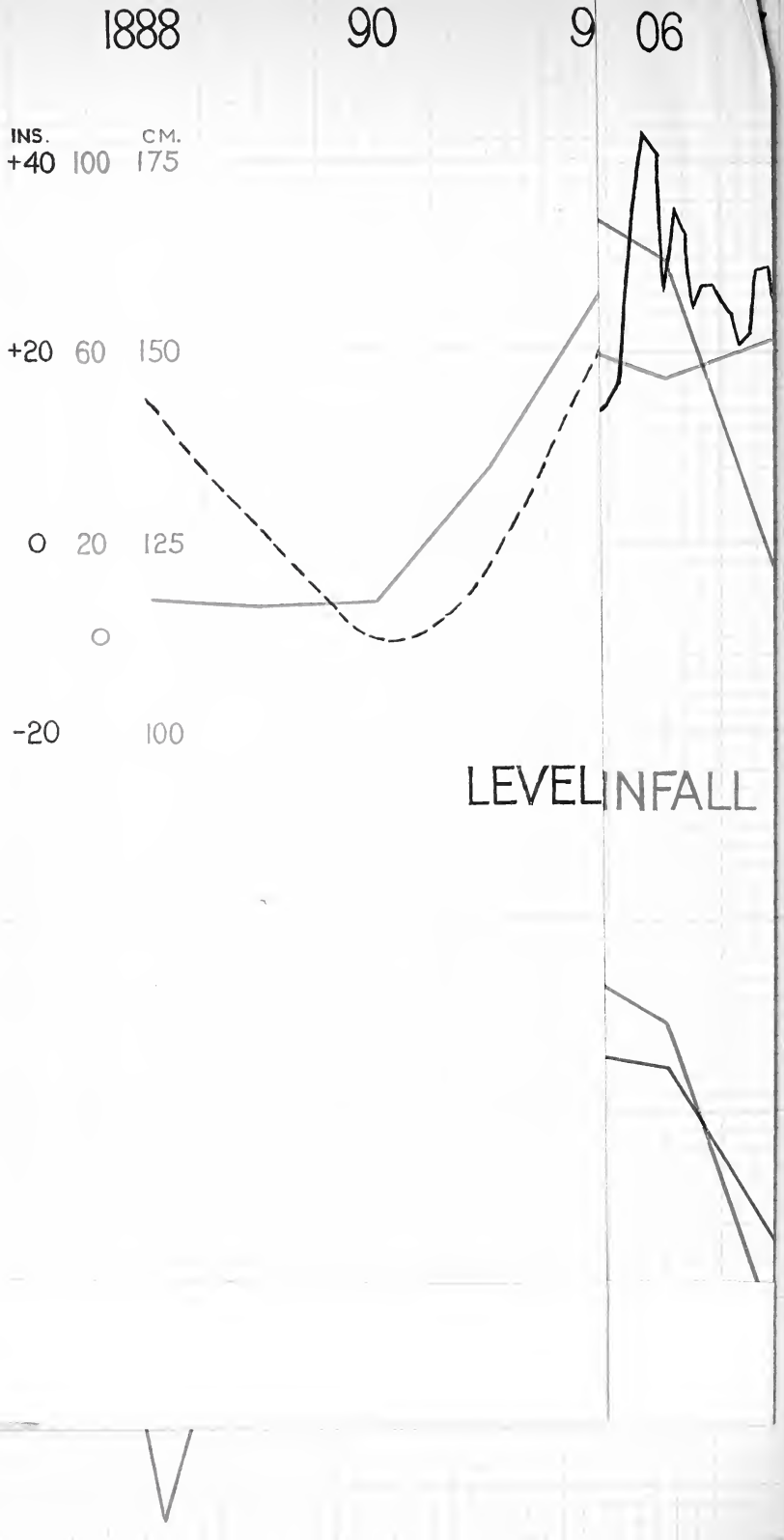


LEVEL OF LAKE VICTORIA [Black] SUNSPOT NUMBERS [Red] RAINFALL OVER LAKE PLATEAU [Green]



LAKE VICTORIA - CHANGE OF LEVEL FROM YEAR TO YEAR [Purple] RAINFALL OV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The Journal of the East Africa and Uganda NATURAL HISTORY SOCIETY.

June, 1925. *No. 22.*

THE FLUCTUATIONS OF LAKE VICTORIA.

By C. E. P. Brooks, M.Sc.

The variations of level which Lake Victoria undergoes from time to time are of great importance in the economy of Uganda, and since 1895 several lake-level gauges have been in use at various points, by means of which the level is measured daily. These gauges consist of pillars of wood, stone or metal firmly fixed in the lake; on these pillars a scale is marked in inches. The records are now sufficiently long for an attempt to be made to analyse them, and the results of such an analysis are here set out (1). The lake-level data employed are those from the gauge maintained by the Lake Engineering Division of the Uganda Railway at Kisumu, at the head of the Gulf of Kavirondo on the eastern side of the lake. This gulf is a small inlet connected with the main body of water by a narrow channel; it has no large river flowing into it and is in every respect suitable for the observations of level. These records have been continuous from August 23rd, 1899, to the present time. From the beginning of 1896 until July 31st, 1899, the records taken at Port Victoria have been utilised; this at the south-western end of Berkeley Bay, an inlet of moderate size on the north-east shore of the lake. From August, 1897, to September, 1898, there was a gap in the Port Victoria records owing to the Soudanese mutiny; this gap has been partially filled by means of observations taken on the gauge at Luba's, near the outflow of the lake into the Nile. Between August 1st and 22nd, 1899, the Port Victoria gauge was moved to its present site at Kisumu (formerly termed Port Ugowe); the difference between the base levels of the old and new sites was computed from the observations at Luba's and Port Alice (Entebbe), but there is a possible error of two or three inches. Thus from January, 1896, to July, 1899, the observations are mainly those taken at Port Victoria, plus a correction to make them refer to the same zero as the later observations; from August, 1899, onwards the observations were taken without a break at Kisumu.

At first sight it may seem rash to calculate the changes of level of so large a body of water as Lake Victoria from the observations at a single gauge, but for the purpose of arriving at general conclusions one gauge is sufficient. The only way in which considerable differences of level between one part of the lake and another could arise is through displacement of the water by considerable differences

(1) Th materials on which this study is based are mainly derived from the following publication by the Meteorological Office, London: Geophysical Memoirs, no. 20 Variationss in the levels of the Central African Lakes Victoria and Albert, by C. E. P. Brooks, M.Sc.

of atmospheric pressure over different parts of the lake or by continuous strong winds, neither of which are found in Uganda. In the Baltic it has been found that the variations of level in the course of a few days due to these causes may reach several feet, but in Lake Victoria the maximum difference is probably never more than a few inches, while the average level during one year may differ from that during another year by nearly four feet, so that the short period and local changes are negligible in comparison with the changes from year to year.

Table 1 shows the mean level of the lake at Kisumu in each year from 1896 to 1923. The zero of the gauge is stated to be at a height of 3,726.15 feet above mean sea level. The means were obtained by taking the average of the highest and lowest gauge readings each month, as the average monthly range is about a foot, this mean is not likely to differ by more than an inch from the mean of the daily readings, and will serve for our present purpose. Previous to 1896 we have no gauge readings, but certain earlier data are available from the reports of travellers, and these have been summarised by Col. H. G. Lyons. They are fairly continuous from 1888 onwards:

TABLE 1.—LEVEL OF LAKE VICTORIA AT KISUMU, AND SUNSPOT NUMBERS

	Lake Level.	Sunspot Number.
1888-1890	General fall on southern shore	7
1891 ...	Low	7
1892 ...	Very high, heavy rainfall, tendency to rise	73
1895 ...	Very high	64

Year.	Lake Level. (inches)	Sunspot Number.	Year.	Lake Level. (inches)	Sunspot Number.
1896 ...	20	42	1910 ...	1	19
1897 ...	20	26	1911 ...	− 7	6
1898 ...	22	28	1912 ...	−11	4
1899 ...	12	12	1913 ...	− 3	1
1900 ...	− 2	9	1914 ...	− 2	10
1901 ...	3	3	1915 ...	4	47
1902 ...	−10	5	1916 ...	15	57
1903 ...	13	24	1917 ...	35	104
1904 ...	18	42	1918 ...	27	81
1905 ...	15	63	1919 ...	8	64
1906 ...	29	54	1920 ...	3	38
1907 ...	21	62	1921 ...	− 5	25
1908 ...	10	49	1922 ...	−16	15
1909 ...	8	44	1923 ...	− 9	5

From these remarks and from Table 1 we see that the lake was low in 1890, 1902, 1912, and 1922, and high in 1895, 1906, and 1917; both the low and high levels recur at intervals of about eleven years. It is well known that the number of spots on the sun also has an eleven-year periodicity, and it is interesting to compare the maxima and minima of the lake-level with the maxima and minima of sunspots:

Lake Level.		Sunspots.	
Minima.	Maxima.	Minima.	Maxima.
1890		1889	
	1895		1893
1902		1901	
	1906		1905
1912		1913	
	1917		1917
1922		1923	

The annual means of the sunspot numbers are shown in Table 1. The agreement is very close. It is brought out in figure 1, in which the level of Lake Victoria is plotted on the same diagram as the mean sunspot numbers. The level previous to 1896 has been sketched in from the data given above. The parallelism between the two curves is so remarkable that it is quite evident there must be some connection between them. Since we cannot suppose that Lake Victoria influences the sunspots the only inference is that in some way the sunspots influence Lake Victoria.

Let us first of all study the various factors which affect the level of a lake. In a cistern partly filled with water the level of the water is determined by the amount of water put in and the amount of water taken out. It is the same with a lake—the level is determined by the water put in, by rivers flowing into it and by rain falling directly on its surface, and by the water taken out, by rivers flowing out of the lake and by evaporation. The amount of water brought into the lake by rivers is the amount of rain falling on the lake basin, less that lost by evaporation from vegetation and from the soil. Therefore

the change of volume of the lake is equal to the rainfall over the lake and its basin less the sum of the evaporation over the lake and its basin and the run-off in rivers. Let us try to determine these quantities.

Statistics of the rainfall over the Lake Plateau are collected each year by the Physical Service of Egypt, which takes great interest in the sources of supply of the Nile, and Mr. P. Phillips, Director of the Hydrological Department, has been good enough to send me (through *Nature*) a copy of the average fall over the Plateau each year from 1904 onwards. The annual average rainfall is 57 inches. Over the lake itself the annual average is probably about 40 inches. The area of the lake is about 66,000 square miles. Thus during an average year some 76 cubic miles of water fall over Lake Victoria and its basin, and have to be disposed of somehow. Sir William Garstin's measurements show that about 4½ cubic miles annually flow out of the lake into the upper waters of the Nile at Ripon Falls, so that the balance, rather more than 70 cubic miles, or 94 per cent., must be lost by evaporation.

A comparison between the change of level of the lake between January 1st of one year and January 1st of the succeeding year on the one hand, and the rainfall over the lake basin during the year on the other hand (table 2), shows that when the rainfall is above normal the lake rises, and when the rainfall is below normal the lake falls. The rise or fall of the lake is almost exactly proportional to the excess or deficit of the rainfall compared with the average. Thus during the two years 1916 and 1917 the total rainfall (both years together) was 139 inches, giving a total excess of 25 inches in the two years, and the lake rose by 33 inches. In 1918 the rainfall was only 37 inches, giving a deficit of 20 inches, and the lake fell by 28 inches. In this way, taking all the figures into account, we find that on the average, a rainfall of 10 inches above the normal causes a rise of the lake of 14 inches; similarly a deficit of 10 inches of rainfall causes a fall of 14 inches. The area of lake and basin together is 3½ times the area of the lake alone, however, so that if all the rain found its way into the lake an excess of 10 inches should cause the lake to rise by 35 inches instead of only 14. The difference of 21 inches can be accounted for in two ways, firstly by supposing that part of the rainfall goes into the soil and only reaches the lake gradually, and secondly by supposing that there is very great evaporation from the soil and from the vegetation. The remarkably close agreement between the rainfall in one year and the change of level in the same year shows that the amount of water held in the soil cannot differ greatly from year to year; it also shows that the evaporation from the soil and vegetation must be very nearly proportional to the rainfall.

TABLE 2.—CHANGE IN LEVEL OF LAKE VICTORIA AND RAINFALL OVER LAKE PLATEAU.

Year.	Change of level from Jan. to Jan. (inches)	Rainfall above or below normal. (inches)
1904	− 9	− 2
1905	+ 7	+11
1906	+ 5	+ 7
1907	−14	− 9
1908	+ 2	+ 2
1909	− 7	− 9
1910	−15	− 7
1911	− 5	− 3
1912	+ 8	+ 6
1913	+ 5	− 2
1914	+ 1	+ 9
1915	+ 8	+ 6
1916	+12	+14
1917	+21	+11
1918	−28	−20
1919	− 5	+ 1
1920	−10	− 2
1921	−12	−11
1922	− 7	− 5

We can now make the following table to account for the rainfall falling over the lake and its basin:

Rainfall over lake basin (excluding the lake itself) ...		60 cubic miles
Loss by evaporation before reaching lake ...	(about)	35 cubic miles
Amount reaching lake	(about)	25 cubic miles
Rainfall on surface of lake	(about)	16 cubic miles
Total water reaching lake		41 cubic miles
Run-off		5 cubic miles
Loss by evaporation from lake surface		36 cubic miles

The latter amount, 36 cubic miles, is sequivalent to the removal each year of a layer of water 63 inches deep over the whole lake.

How do sunspots come into this balance-sheet? Since the level of the lake shows so close an agreement with the number of sunspots, the latter must have a dominating influence on one or both of the prime factors which influence the lake-level, namely rainfall and evaporation. The average rainfall over the lake plateau according to Mr. Phillips is set out again in table 3 as a difference from normal. The second column shows the sunspot numbers; it is seen that the rainfall is generally high when sunspots are rising and low when sunspots are falling. The third column shows the change in the average sunspot number from one period of twelve months (July to June) to the succeeding twelve months, and this column shows good agreement with the rainfall amounts. This agreement is expressed numerically by what is known as a "correlation coefficient." A correlation coefficient of +1 indicates complete harmony between the variations of the two elements which are being compared, a coefficient of −1 indicates complete opposition between them, and a coefficient of 0.0 indicates complete independence.

Table 3.—Relation of Rainfall to Sunspots.

Year.	Plateau Rainfall.	Sunspot number.	Change in sunspot number.
	inches.		
1904	− 2	42	+17
1905	+11	63	+10
1906	+ 7	54	− 3
1907	− 9	62	− 8
1908	+ 2	49	− 2
1909	− 9	44	−17
1910	− 7	19	−20
1911	− 3	6	− 9
1912	+ 6	4	0
1913	− 2	1	+ 1
1914	+ 9	10	+23
1915	+ 6	47	+32
1916	+14	57	+12
1917	+11	105	+25
1918	−20	81	−16
1919	+ 1	64	−32
1920	− 2	38	−18
1921	−11	25	− 9
1922	− 5	15	−14

Now the correlation coefficient between plateau rainfall and the change of sunspots from year to year is +0.64, which indicates good but by no means remarkable agreement. The correlation coefficient between plateau rainfall and the change in the level of Lake Victoria (table 2) is +0.91, indicating a very close agreement. Since the level of the lake depends on the rainfall and the rainfall depends on the sunspots, it is evident that the level of the lake would show agreement with sunspots even if there were no other factor. To measure this agreement between lake level and sunspots through rainfall, we multiply together the two correlation coefficients given above, *i.e.*, 0.64 × 0.91 = +0.58, and this would be the correlation coefficient between lake level and sunspots if no other factor than rainfall had to be taken into account.

But the connection between lake level and sunspots is much closer than this; it gives a correlation coefficient of +0.87 (table 1). Therefore some other factor in the lake level besides rainfall must be closely connected with sunspots, and from what has previously been said it will readily be seen that this factor must be evaporation. Evaporation must be much less in the years immediately preceding sunspot maxima than in those immediately preceding sunspot minima.

This conclusion is quite unquestionable, and throws interesting light on a well-known meteorological paradox. It is known that the sun is hottest at sunspot maxima and coolest at sunspot minima, but W. Köppen and others have shown that temperature in the tropics is on the average about a degree (Fahrenheit) lower near sunspot maximum than it is near sunspot minimum. That is, the hotter the sun the cooler the earth. This unexpected result has been attributed to greater evaporation from the oceans at sunspot maximum causing greater cloudiness and therefore a lower temperature. But we see that over Lake Victoria which is a very large sheet of water, evaporation is least, not greatest, at sunspot maximum; there seems no reason why this conclusion should not be extended to the oceans also. Hence the low temperature at sunspot maxima cannot be due to increased evaporation at those times but must find some other explanation.

It may be of interest to refer briefly to two other periodical variations shown by the level of Lake Victoria, namely the annual and diurnal changes. Superposed on the marked eleven year periodicity is a distinct annual wave with a range of ten inches. This annual wave is sufficiently distinct to be seen as a series of peaks and valleys diversifying the great sweeps of the eleven-year

periodicity in figure 1. Over the twenty-six years 1896, 1899 to 1903 the average level in each month was as follows (inches above zero):

Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.
5	5	5	8	13	13	10	7	5	3	3	5

The lake is normally lowest in October and November, rises very slowly until the end of March, and rapidly during April and May, remains steady during June and then falls moderately rapidly until September.

The other periodic variation is completed in the space of twenty-four hours. For the past few years the lake gauge at Kisumu has been read twice daily, in the morning and evening. These readings show that the level during the evening is persistently higher by a few inches than that during the morning. During the five years 1917 to 1921 the average difference was 4 inches; it was greatest in February (5 inches) and least in July and October (3 inches). This diurnal variation is probably due to the influence of land and lake-breezes, which owing to the great area of Lake Victoria are well developed. During the night and early morning the land breezes tend to blow the water away from the shores on all sides, accumulating it in the open part of the lake. During the day, on the other hand, the lake breeze tends to drive the water before it, and it collects against the shore, raising the level there at the expense of the centre of the lake. Such an effect would be well developed in an inlet like Kavirondo Gulf. The months when the effect is best shown—December to April—are in general those with least rain on the shores of the lake, and also mainly those in which the diurnal range of temperature is greatest; hence in these months the land and lake-breezes would be expected to be most vigorous.

Another lake-gauge from which the records have been studied is that at Butiaba in Lake Albert. This gives similar results to those obtained from the gauge at Kisumu, showing that the eleven-year cycle is developed in Lake Albert as well as in Lake Victoria. Owing perhaps to its smaller area the fluctuations are in fact more than twice as great in Lake Albert, the absolute range being from 6 inches below zero in July, 1908 to 156 inches above zero in November, 1917, a difference of nearly fourteen feet. The annual means are as follows (inches above zero):

1904	29	...	1910	—	...	1916	48
1905	18	...	1911	9	...	1917	110
1906	26	...	1912	21	...	1918	115
1907	22	...	1913	24	...	1919	53
1908	1	...	1914	26	...	1920	33
1909	9	...	1915	37	...	1921	10

Table 4.—Variations in the level of Lake Albert.

In the latter part of the record the agreement with sunspot numbers is remarkably close.

Thus the Central African Lakes Victoria and Albert present us with one of the most remarkable known associations of cosmical and terrestrial phenomena. The agreement between the sunspot curve and the lake-levels in the past thirty years has been so close that one can have little hesitation is prophesying that it will be maintained in the future, and that having reached their lowest level for the time being in 1922 the lakes will rise again, slowly at first, and then more rapidly, to another maximum about 1927 or 1928.

THE GEOGRAPHICAL DISTRIBUTION OF ANIMALS.

By G. D. Hale Carpenter, d.m., b.ch., f.l.s., f.e.s., f.z.s,

A few generations ago the curious differences between various parts of the world as regards the creatures to be found therein were accepted as part of the general order of things, as pre-ordained and therefore inexplicable.

There were hippopotamus in Africa and tigers in India because they had been created there, and there was no more to be said about it.

The great upheaval of this view produced by Lyell's " Principles of Geology " and Darwin's " Origin of Species " resulted in a totally different point of view. Animals of a certain kind live in a certain place because their *ancestors* lived there; but there is more than this to be said. Their ancestors were not *exactly* like themselves, and study of fossil remains of creatures of other days shows that the present-day distribution of a type does not correspond with the distribution of its byegone relatives. To take a simple example: at the present day the hippopotamus does not live in Madagascar, but there are found abundantly remains of a small kind of Hippo which shows that it did live there once though not quite in the same form as the massive animal so well known on the African continent. Now as it is unlikely that the ancient form of hippo swam across the wide gap separating Madagascar from the mainland we must postulate a former closer connection between the two, and we shall see later that there is geographical evidence for this. This is the kind of problem that makes the study of the distribution of animals (and of course of plants also) so very interesting.

The only intelligible explanation of the differences in distribution of animals and plants over the surface of the earth is one of constant changes in the distribution of land, water, and ice, and therefore of climates. These changes have been associated with constant evolution of forms of life, at least of those which had in them sufficient adaptability to meet changes. Some, not easily adapting themselves to changed conditions have completely died out and have left no descendants, for instance the gigantic reptiles known as Deinosaurs: others, once very prevalent in numbers are now represented by scattered descendants in different parts of the world, such as the Giraffe, Okapi, and Prong-horn buck of N. America which, though at the present day placed in two different families, are closely united by fossil forms.

Again, long ages ago some ancient forms became isolated from other creatures because the area they inhabited was cut off from adjacent areas by subsidence beneath the water of an intervening portion. If this area for long ages was exposed to uniform conditions its inhabitants may have remained more or less unaltered; but if the conditions were variable the animals subjected to them may have struck out along a line of their own unhampered by competition from the outer, larger, world. In one case we should find animals of lowly, unspecialized type; in the other, very peculiar and highly specialised forms. It must be remembered that the changes in the face of the earth, and therefore of climate must have caused great migrations of the beasts of days long past, which sought to avoid excessive heat or cold, flooding or drought, growth or disappearance of forest, etc., etc., produced by the gradual but long continued changes in elevation of the surface of the land. It is most important thoroughly to assimilate the modern view of constant change for ages past in the features of the earth, and to bear in mind that only adaptable organisms could survive through these changes unless they found somewhere where they could seek refuge from change, as in the deepest parts of the ocean. Forms of life known as Crinoids or " Sea-lilies " are now to be found in the abysses of the ocean whose ancestors, in untold myriads, are largely responsible for forming great beds of limestone by the deposition of their calcareous framework at the bottom of shallow seas: changed conditions proved inimical to them and their descendants can only live in the deeper waters. Through adaptation to meet changing conditions the descendants of a group existing at any one time may be very different indeed from their ancestors. The simple example of the " Woolly Rhinoceros," which at one time inhabited the land that is now England, illustrates this. This animal lived in times of ice and cold and had a dense woolly coat. As the glacial epoch passed away the climate became warmer and the thickly-clad animal had to face a different kind of world. Certain individuals proved adaptable and they and their descendants lost their thick coats and so were better able to live in the greater heat. Rhinoceros at the present day is entirely a tropical genus. It is also important to remember that, speaking very broadly, one at least of the large land areas of the present day, Eurasia, has always been there, or at least that there have always (of course, by " always " is meant during the time of evolution of mammals) been some areas of land more or less connected with each other at different priods in the position now occupied by Europe and Asia. This great centre seems in very many cases to have been the cradle from which families dispersed in all directions, even the remote ancstors of man and his near relations, apes and monkeys..

If the surface of the globe be considered from the point of view of the naturalist, it will be found that geographical regions do not at all exactly coincide with zoological regions.

In spite of the vast distance between Great Britain and Japan there is a great deal in common between the animal life of these two groups of islands: if the traveller knows his British birds he will at once recognise similarity in the type of Tits, Wagtails, Wrens, Sparrows, Thrushes, etc., some even identical with the British species. Insects, too, may be found of the same general types as those he knows.

Yet, in the Malay Archipelago there are two islands about as large as Corsica, separated by a strait only fifteen miles wide at its narrowest part, whose birds and animals differ far more than do those of England and Japan, although there are a certain number of forms common to both. (See map II.)

These are selected cases; but even in large areas the zoological and geographical areas do not coincide.

Thus, the term Europe does not define accurately the range of any genus of mammals or birds; they range into Asia or Africa as well: but there are a few species limited to part of Europe, though a species of wide distribution through Europe is not necessarily confined to that continent. Many animals are found in Asia and Africa, *e.g.*, the leopard. In Africa very few groups of animals range over the whole of it without going into Europe, Asia Minor, or Arabia.

Australia does agree better with both points of view, but as we shall see, zoological and geographical definitions of Australia are not the same.

Naturalists have differed somewhat as to the best way in which to mark out the zoological regions of the world: that adopted here was planned by A. R. Wallace, the co-discoverer with Darwin of the basic principle of evolution through Natural Selection, and is described in his most fascinating works "The Geographical distribution of animals" and "Island Life."

Europe with most of Asia and Africa north of the tropic are linked together to form the Palaearctic region.

The continent of Asia south of the Himalayas, with the north-west half of the Malay Archipelago may be given, roughly, as the extent of another region of equal zoological importance with the

MAP 1.

WALLACE'S ZOOLOGICAL REGIONS.

1. Laccadive Isles, 2. Maldive Isles, 3. Chagos Isles.
4. Seychelles, 5. Aldabra Isles, 6. Comoro Isles, 7. Mauritius & Burbon.
8. Rodriguez.

Palaearctic, though very much smaller in area. This is known as the Oriental region. The other half of the Malay Archipelago, with Australia, New Guinea, New Zealand and innumerable islets forms the Australian region. Africa, south of the tropic, forms the Ethiopian region: this also embraces the southern half of Arabia, but no other part of Asia.

As regards the New World the zoological divisions correspond more nearly with the geograpical, save that " Central " and S. America are classed together, making one region, the Neotropical.

North America forms the Nearctic region, the name indicating sufficiently well the resemblance to the Palaearctic or old world northern region.

Let us now take these five regions, of more or less equal zoological value, and see what are their characteristics. In order to do this a few technical terms must be used in connection with the classification of things in general. The system of classification now used was devised by the great Swedish naturalist of the eighteenth century, Linnaeus, and many of his names are used at the present day. The smallest unit is the species, which is the name for a number of individuals which, closely resembling one another will breed with each other and produce fertile offspring. Species of course may be composed of many or few individuals, and are then known as " common " or " rare " species. Since no two individuals of a species are *exactly* alike in all their details we must admit another grading into varieties. Generally speaking, varieties of a species will breed together, but if very well marked two distinct varieties may be sufficiently different not to breed together, at any rate to any great extent, although each may breed with an intermediate form: these may then be termed sub-species. Sometimes varieties differing very widely from each other at the extremes of the range of a species may only be known as forms of one species by the transitional forms from regions in between the extremes. The extreme forms are known as Geographical races.

Examples of species are Lions and Leopards: the lovely Snow-Leopard of Thibet and the Himalayas and China is a geographical race: the Black Leopard is a variety; it is not confined to any particular locality, though it occurs more commonly in Asia than in Africa. The Black and Snow-Leopards would probably not breed together, yet they can be shown to be of the same species by connecting links.

Now lions and leopards have certain characteristics in common, for instance, the retractile claws. This unites them into a larger group known as a genus, the genus *Felis*.

This genus has certain characters in common with another genus, that known as *Cynaelurus*, or the Cheetah. Their dental formula for instance is the same but *Cynaelurus* differs from *Felis* in not having retractile claws. These two genera are contained in the family *Felidae*. Another family, *Canidae*, or dogs is distinguished by well marked characters: their teeth are decidedly different from those of the cats for instance.. But in both families they are of a type framed for flesh eating, so these families with others, are united in a higher group or order, *Carnivora*. But these animals have certain characters in common with members of others orders such as Rodents (Rabbits, Rats, etc.) or Primates (Man and Monkeys): they all have hair and suckle their young. These orders are therefore united into a higher group, the class *Mammalia*.. But Mammals share with Reptiles, Frogs, and Birds the structure known as backbone or vertebral column, and are therefore united with them into one of the main divisions of the animal kingdom, the Phylum *Vertebrata*, of equal rank with other Phyla such as *Mollusca* (snails, mussels, slugs, etc.) or *Arthropoda* (spiders, crabs, insects, centipedes, etc.)

When one has mastered the elementary principles of classification it is easier to understand the arguments used in discussing the curiosities of geographical distribution. It must be remembered that this system is of the same character as a genealogical tree: all members of one group are descended from some member of byegone days belonging to the group next above: that is, while lions and leopards can boast a common ancestor of so close a degree that they can almost be called first cousins, we must search very much further back for the common ancestor of lions and wolves, and even more remotely for an ancestor who would be shared by these animals as well as by buck, rats, and whales, not to mention mankind.

The earliest known mammal appears to have been an extremely insignificant beast, and would probably be despised by an up to date guinea pig!

Armed with this small vocabulary of technical terms let us commence with the animals of the Palaearctic, or old world northern region. As regards mammals there are some very well marked characteristics. The entire group of goats and sheep, with the exception of the Rocky Mountain goat of N. America and one wild sheep in the Nilgiris of S. India, is confined to this region. The well-known Barbary sheep of N. Africa, with the long flowing hair on its throat and chest, exemplifies well that that part of Africa is, zoologically Europe and not Africa.

The true moles, family *Talpidae*, are confined to the Palaearctic and Nearctic regions, and there are two genera peculiar to the former.

Typical hedgehogs are characteristic of this region, though they are also found in S. Africa and the northern part of the Oriental region.

True Badgers of genus *Meles* are only found here, and there are several peculiar genera of deer.

Among birds many genera are only Palaearctic; Robins, the Long-tailed Tit, Bullfinches, Pheasants (except for one species in Formosa which lies in the Oriental region). There are genera of reptiles confined to this region such as *Lacerta*, to which belongs our common English lizard and the green lizard of South Europe. Among amphibia the newt-like Salamander is confined to the Palaearctic region.

Insects characteristic of this region are the curious butterflies of genus *Parnassius* found on mountains: the European species thinly scaled dull yellowish white spotted with black and red or yellow are, some of them, familiar to visitors to Switzerland in the summer: a few species are known also on the Rocky Mountains. A very important genus of ground beetles, *Carabus*, familiar to gardeners, is also characteristic of the Palaearctic region.

We now pass to consider the Ethiopian region, composed of the African continent south of the tropic, that part of Arabia south of the tropic, and Madagascar with its associated isles.

This region is characterised very clearly by deficiencies as well as by the presence of certain predominant groups. For instance the Ethiopian region differs from all the others save the Australian in having no bears and no deer, both of which occur in that northern part of Africa belonging to the Palaearctic region. Nor has it any wild oxen which abound in Asia and even occur in Europe—or did, until the European bison of the Caucasus was destroyed by the Bolshevists as having been reserved for royal hunters. Wild sheep also are absent from this region. As if to compensate for this the Ethiopian rgion is characterised by the great development of other families of hollow-horned ruminants commonly grouped together under the popular "Antelopes." While these are wholly absent at the present from the Palaearctic region, they are sparsely represented in the Oriental region by the Nylgliare and Blackbuck, and in the Palaearctic region by a single rather curious animal connecting antelopes with giraffes and deer, namely the Prong-horn buck. Other well-known characteristics of the Ethiopian region are the Hippopotamus, and Giraffe with its cousin the Okapi. This region shares with the Palaearctic the family *Equidae* to which the Zebras and Wild-Asses belong, and with the Oriental region Elephants, Rhinos, Lions, Leopards, Civets, Hyaenas, etc.

The higher monkeys known as Anthropoid apes are especially characteristic of the Ethiopian and Oriental regions: Gorillas and

Chimpanzees are found only in the former. Baboons are found nowhere else. The very peculiar lemurs—the lowest members of the order Primates—which represent a stage in the past history of man and the monkeys are found in this region in so great a proportion of their total numbers that they are extremely characteristic of it: a few occur in the Oriental region. The families of Elephant-Shrews and Golden Moles are only found in the Ethiopian region. The very lowly order of *Edentata* is represented by forms such as the Aard-vark peculiar to this region, while others, such as the *Manis*, often erroneously called Armadillos, are shared with the Oriental region. Among birds, Guinea-fowls, Plaintain-eaters, and Colies or " Mouse birds " are found nowhere else. Hornbills and Sunbirds are shared with the Oriental region: the Ostrich family is shared with the Oriental and Neotropical regions. The Secretary bird and Whale-headed Stork form genera found nowhere else.

Among reptiles may be mentioned Puff Adders and Chamaeleons as confined to the Ethiopian region: while it shares with the Oriental region such families as Pythons and Cobras.

Among insects one family of butterflies is particularly characteristic, namely the *Acraeinae*, which is familiar to everyone by at least one or two common species of black and scarlet, or brown, or yellow, conspicuous butterflies of forests and woodlands.

Among two winged flies the genus *Glossina* or Tse-tse flies is at the present day confined to this region, and the fact that one species extends into Arabia shows well the difference between geographical and zoological regions: another fact, that *Glossina* is found in Colorado shows well the difference between present and past distribution of a species.

The molluscs of the Ethiopian region also show peculiarities—the huge *Achatina*, largest of all known land shells, are confined to it.

We now come to consider the Oriental region, geographically small but zoologically of high importance. Roughly, it comprises the mainland of Asia south of the Himalayas and a rather ill-defined line eastwards to the coast of China, and the Malay Archipelago as far as the Philippines, Borneo and Java. There is not, as there was shown to be in the Ethiopian region, a great development of one group of animals characteristic of the Oriental region, but there are many peculiar forms. Thus the strange insectivorous creature known as *Galeopithecus*, which volplanes from tree to tree by virtue of parachutes of skin stretched between its limbs, is found nowhere else. A whole family of large, furry tailed Tree-Shrews is only found in this region. Among the *Felidae* while Lions and Leopard are shared with the Ethiopian region, the Tiger is peculiar.

The anthropoid apes are represented by the Gibbons, and the Orang Utang, confined to Borneo.

An extremely interesting large animal, illustrative of the peculiarities of distribution, is the Tapir of Malay, whose nearest living relative is found in South America!

Of birds, there are many splendid Pheasants confined to this region, and the jungle fowl from which are derived our fowls also is not found elsewhere: the same is the case with the Tailor birds. Abundant Hornbills and Barbets are shared with the Ethiopian region. Reptiles are extremely abundant but the species are not especially characteristic. The insects of the Oriental region are of extreme beauty; the Swallow-tail butterflies reaching a size and grandeur unsurpassed elsewhere.

Contiguous with the Oriental region, indeed separated from it only by a very remarkable boundary line to be discussed later, is the Australian region which has more peculiarities than any other. Its great feature is the almost total absence of the forms of animals which abound elsewhere, their place being taken in a remarkable manner by the order of Marsupials, characterised by the pouch in which the young animal, born in a very incomplete state of development, is nourished until it is able to get about. The different types of smaller animals in the regions previously mentioned are matched by marsupials; some are analogous to wolves, others take the place of Genets, Weasels, etc.: some are rabbit-like, some insectivorous, but there are none to represent the larger herbivores: there is a marsupial mole, even! It is perhaps too much to expect marsupial bats! Well-known examples of Marsupials are Kangaroos and their smaller relations Wallabies, Bandicoots, and the Opossums (or Phalangers, for the name Opossum more properly belongs to the American animal).

Especially to be noted in the Australian region are the lowliest of all Mammals, the Duck-billed Platypus and spiny Anteater or Echidna, which have reptilian affinities and lay eggs like reptiles and birds. The birds of the Australian region are by no means so remarkable as the mammals, although there are remarkable absentees: for instance, such widely distributed families as Vultures, Woodpeckers, Barbets, Pheasants and Bulbuls are quite unrepresented.

Parrots are extremely abundant and great Goatsuckers (" More-porks ") and Kingfishers (Laughing Jackass) are noticeable features of bird life.

Lyre-birds, and the remarkable Mound-building Megapodes which leave their eggs to hatch in a heap of vegetable refuse, are only found in the Australian region. The Ostrich family is represented by

Emus and Cassowaries. The wonderful Birds-of-Paradise are found nowhere else in the world but in a part of this region, namely New Guinea and its neighbouring islands. As regards Reptiles, this region possesses an example which equals in interest to the Duck-billed-platypus, as it is of extreme antiquity and the only living representative of a group that flourished in the age of reptiles before mammals appeared, this is the lizard-like Tuatera of New Zealand.

We now come to America, divided into Nearctic and Neotropical regions. The Nearctic region is so close to the Palaearctic, and passage across the narrow straits from one to the other would be made so easy by slight alterations of level of the submerged land that it is not surprising that there are no very marked differences between the respective faunas.

The Nearctic region has no Hedgehogs, Wild Pigs, or Dormice and only one species of wild Goat (the Rocky Mountain Goat) opposed to score of Sheep and Goats in the Palaearctic region. But Cats, Wolves, Foxes, Bears, Squirrels, Beavers, Marmots, Reindeer, Elk, all show very close relations between these two regions. Even the bison, now thought of as so characteristic of America, has its counterpart in the European bison of the Caucasus, though I believe they have now all been destsroyed by the Bolshevists.

The Racoons, however, are peculiar to this part of the world, and the Skunks are quite different from their nearest Asiatic relations.

The Prong-horn buck is a very interesting animal peculiar to this region and forms a special family which is in some ways a link between deer and antelope. The American Opossum is of great interest as it is of the ancient family of Marsupials which are so prominent a feature in the Australian fauna.

Among birds there is the same general likeness to the Palaearctic fauna, but at the same time there are real differences, for instance, true Starlings and Fly-catchehs are absent. But certain well-marked families are only found in the Nearctic region, for instance Turkeys and Blue-Jays. The reptiles are more characteristic; one need only mention Rattlesnakes and Iguanas which are found nowhere else.

Lastly, there is the Neotropical region, comprising, roughly, Central and South America where we find a very remarkable assemblage of peculiar forms. Thus, the monkeys with prehensile tails, Marmosets, blood-sucking Bats, Sloths, Armadillos, and Ant-eaters are found nowhere else. The pig family is represented by the Peccaries, the Camel family by Ilamas: among rodents the Chinchillas, Capybara and Agoutis are peculiar to the Neotropical region.

The Tapir of South America has its only near relative in the Malay Archipelago. There are some interesting links with the

Ethiopian region among the mammals of the very lowly group Edentata—the lowest group but one of mammals. The Edentates reach their maximum number in the Sloths, Armadillos, and Ant-eaters of South America, but there are representatives in Africa in the scaly Manis (often erroneously called Armadillos, just as the big monitor lizard is erroneously called iguana) and the curious ant-eating " Aard vark " (*Orycteropus*). Another link with the Ethiopian region is provided by Snakes, a certain family of which is almost entirely confined to South America, but one species occurs in Africa: it is at present only known by two specimens, one from Katanga in the Brussels Museum and one, found by the writer in Portuguese East Africa, in the British Museum.

The birds of the Netropical region are as characteristic as the mammals. Humming-birds, for instance, Tanagers, Toucans, Macaws, Curassows and many others whose names are less familiar. It is interesting to note that the ostrich family is represented by the Rhea. As with mammals, there are striking absentees. Thus there are no Tits, true Flycatchers, Shrikes, Sunbirds, Starlings, Bee-eaters, or Rollers. Among insects may be mentioned the very characteristic butterflies *Heliconinæ* and *Ithomiinæ*.

Study of the vegetation of these five main regions shows similar phenomena: for instance the *Eucalyptus* of Australia; but there is no occasion here, as we are dealing with animals, to go into the flora. Suffice it to say that any naturalist dropped from the skies into a region of whose place on the map he was ignorant would soon be able to decide by the life around him what part of the globe he had entered.

This important principle leads us to a most fascinating theme, the decision as to the origin of any island or group of islands by the study of the forms of life found upon it.

The history of this subject is important and goes back to Charles Darwin's epoch-making voyage round the world in the " Beagle " in 1831-36. At that time it was, of course, known that a group of islands might show great differences in the animals inhabiting the separate islands of the group, which also might be even more different from their relations on the nearest mainland.

It was supposed, however, that they were thus different " because they were so created," which " explanation " sufficiently stifled all further enquiry. On his visit to South America Charles Darwin noted that he was particularly struck by the character of the fossils which he found there. As we have seen, one of the characteristics of the Neotropical fauna is that here is the metropolis of the lowly mammals known as *Edentata*, and Darwin was much impressed by finding abundant fossils of extinct beasts of giant size belonging to the same

order. He was thus led to conclude that there was *some relation by descent between animals succeeding each other in the same area.* This conclusion, of the most fundamental importance, was thus directly opposed to the theory of special creation.. For why should a series of animals following each other in time bear obvious resemblances to each other if each type was specially created?

On the other hand, as Darwin wrote in his journal, "this wonderful relationship in the same continent between the dead and living will, I do not doubt, hereafter throw more light on the appearance of organic beings on our earth and their disappearance from it, than any other class of facts."

The other fact of supreme importance which impressed Darwin was the relation between the animals and plants of several islands of the Galapagos archipelago on the equator in the South Pacific Ocean, and also the relation between the archipelago as a whole and the mainland of South America, six hundred miles to the east (Map I.). Darwin wrote in his journal, " one is astonished at the amount of ' creative force ' displayed on these small barren and rocky islands and still more so at its diverse and yet analogous action on points so near each other."

A little more detail about the forms of life on these islands will help the understanding of the argument.. On the archipelago there are probably no mammals indigenous, save possibly one species of mouse. Of twenty-six species of land birds twenty-five are peculiar to the islands and thirteen of these are " a most singular group of finches," showing great differences on individual islands but forming such a nicely graded series in such matters as the size of the beak that, as Darwin wrote, " one might really fancy that from an original paucity of birds in this archiplago one species had been taken and modified for different ends." Even more striking than the birds of this small group of islands are the reptiles. A genus of large lizards is represented by two species found nowhere else in the world, one of them being terrestrial, the other aquatic; their nearest allies are the Iguanas which are confined to South America, a significant fact. (This is, perhaps, a suitable place in which to make a strong protest against the widespread and erroneous habit of calling the big Monitor, or Varanus, lizard by the same name as the very distinct South American species.. This habit of transferring names from one continent to another is almost as confusing to the uninitiated as the wonderful grouping of animals, as in a menagerie, in that famous book, " The Swiss Family Robinson."!).

The Galapagos lizards are herbivorous, the aquatic species being remarkable for that reason as it is the only known existing lizard which lives on sea-weed.

Perhaps the best known inhabitants of the Galapagos isles are the Giant Tortoises, some of which may be seen in Zoological gardens; they are found in nearly all the islands of the archipelago.

A most important point is that amphibia (frogs, toads, etc.), are not found on these islands, which peculiarity at once stamps them, with others sharing the same feature, as forming a zoological class of islands: more will be said on this point.

Taking the Galapagos fauna as a whole it is found that its natural affinities are with South America.. Now if the fauna was produced by a special act of creation, why should it especially resemble that of South America any more than that of Africa or elsewhere?

But if a theory of descent is considered, what more natural than that the animals of Galapagos should have been derived from some ancestors which in the far, far past found their way to the islands, and then, being isolated from the competition by large numbers of other similar organisms which is so fierce in large densely populated areas, developed along their own lines into the peculiar genera and species now found nowhere else in the world.

In the fossils of the South American mainland and the fauna of the Galapagos archipelago we have two facts which did more than any others to set Darwin at work on his hypothesis of evolution; the doctrine of the origin of species by means of natural selection modifying the material offered by forms each bound by heredity to a certain degree of resemblance to their parents and each as certainly bound by the fundamental facts of variation to differ from them.

Let us now turn aside for a moment from the study of life to the study of islands in their purely geographical aspect: we shall see that there are two types.. It must be remembered, as I said before, that the details of the surface of the earth have changed immensely in level and that what is now dry land may have been under water; but the reverse is also the case.

So study of the present coast line of an island must be associated with investigation of the past history of that island, by an examination of the submerged land in is vicinity.

There are seen to be two main types. Firstly those which are separated from the adjacent continental areas by such shallow water that a comparatively slight elevation of the submerged part would connect up the whole. Such islands are spoken of as *continental*: that is, at some time or another they have formed part of a continent.

The most obvious example is Great Britain.

The second type of island was clearly expounded by Darwin who showed that with very few exceptions all the remoter islands of the

great oceans were of volcanic or coralline formation and that none of them contained indigenous mammals or amphibia. Such islands are termed Oceanic; they are usually surrounded by seas of considerable depth and occupy isolated positions; such are the Galapagos islands already discussed. It is quite obvious that oceanic islands, having been for all time isolated, cannot be expected to support, by any theory of descent, any four-footed animals except under very exceptional circumstances; for how would their ancestors have got there? But if the fauna of any island were specially created as such there seems no reason why four-footed animals should not have been created there as easily as on mainland.

The same applies to the amphibia. Consequently, the fact that oceanic islands are without indigenous mammals or amphibia is a very powerful argument for evolution. The difficulty that amphibia have to face is not that of transport of the *adults*, but of the eggs. In reptiles it is probable that the eggs, protected by shells, have been transported great distances on floating timber, torn up from a river bank by a flood and washed out to sea. But the soft shell-less eggs of amphibia which require fresh water for their development cannot be thus transported.

Birds can be carried by gales—so can insects; molluses, and eggs of insects, can be transported on trees like those of reptiles. Even adult reptiles are known to have been carried enormous distances across seas in this way.

It is sometimes difficult to realise that the creatures on an oceanic island must be descendants of some individual that has been brought there by chance from time to time since long ages ago, but if the prevailing winds and currents are studied it will be found that the characteristics of the fauna of an oceanic island are such that their ancestors *could* have been brought there by winds and currents. In the case of the Galapagos islands there are very strong currents runnings thither from the American coast; had they been from the opposite direction the island fauna would have been very different, possibly Australian in character.

Let us take another example of an oceanic island, St. Helena, which occupies a very isolated position in the middle of the South Atlantic ocean, eleven hundred miles from Africa and eighteen hundred miles from South America (Map I.). It is wholly volcanic, and dscends extremely steeply into the ocean: within about a mile and a half from the coast there is an abrupt ledge beyond which no bottom is rached with a sounding line of 250 fathoms. Between St. Helena and Africa is a profound gulf reaching a depth of 2,860 fathoms, and an equally deep area extends to the west and south-west.

Thus it is clear that this island can never have been connected with any mainland.

What do we find as regards indigenous fauna? There are no indigenous mammals, reptiles, freshwater fishes, or true land birds, nor any fresh-water bettles or snails.

The chief peculiarity lies in the insects, of which the beetles have been especially studied. Two hundred and three species are known but of these seventy-four are common and widespread and have certainly been introduced by human agencies.

One hundred and twenty-nine are truly aboriginal and all of them but one are found nowhere else in the world. Their affinities are widely spread, for their nearest living relations are found in Europe, Madeira, or South Africa. Now if the insect life of past days is traced back by fossils it is found that in the Miocene age of the Tertiary epoch there were living in what is now Switzerland beetles of types which at the present moment are found in Europe, tropical, and South Africa, and South America. It is therefore possible that the insect fauna of St. Helena has an origin as remote as the Miocene age; that the ancestors may have reached the island from Europe, Africa, or America.

The characteristic vegetation of St. Helena has been almost entirely destroyed by human agencies, but the remnant that is still to be found in the less accessible parts of the island is as peculiar as the fauna. There are now about fifty truly indigenous-flowering plants, of which forty are absolutely peculiar to the island, and their affinities are mainly African. It has been reported that seeds which must have floated round the Cape from Madagascar or Mauritius have been thrown on the shores of St. Helena and have sometimes germinated. On the other hand there is a distinctly American relationship, especially among the species which bear evidence of greatest antiquity..

In conclusion, Wallace's words may be quoted: " We have here an island of small size and great antiquity, very distant from every other land, and probably at no time very much less distant from surrounding continents, which became stocked by chance immigrants from other countries at some remote epoch and which has preserved many of their more or less modified descendants to the present time."

Now lt us turn to Continental islands, commencing with Great Britain. The fauna of our native land is in the great majority of cases identical with that of Europe showing that the separation from the continent must have been very recent so that there has not been sufficient time for British species to become, through isolation and cumulative selection of small variations, very different from their

cousins on the continent. Yet there *are* some differencs and it may surprise some readers to hear that in the Red Grouse we have a bird peculiar to Britain, though it is doubtful whether the differences which distinguish it from its nearest relative, the Willow-grouse of Norway, are sufficient to entitle it to rank as a good species. More interesting still, from its extremely limited distribution, is a species of Wren only found in St. Kilda's isle.

As regards fish, Wallace gives a list of " no less than fourteen well-marked species of fresh-water fishes altogether peculiar to the British Isles "; all belonging to the salmon family and some of them only to be found in one or two small lakes in Wales!

As regards insects, we had at one time a definite British butterfly, a form of the " Large Copper " of the continent.

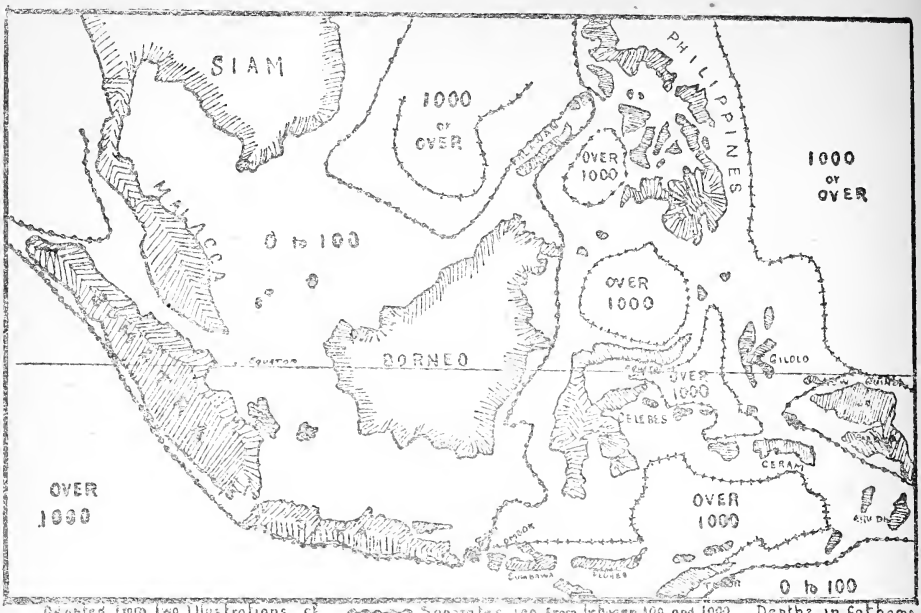
On the whole, however, the fauna of Great Britain is strictly continental and indicates very recent union with the continent.

Let us now go to the east and examine a similar state of affairs in the largest island of the Oriental region, namely Borneo. This island has about one hundred and seventy-five species of mammals, of which one-third are peculiar to it: for instance the extaordinary " Proboscis monkey.." But, taken as a whole there is an almost perfect identity in *general* character with the fauna of Sumatra and the Malay peninsula to the west. So that it seems as if Borneo as an island may be no older than Great Britain, as it is separated from the mainland nowhere by a depth greater than 100 fathoms. But the matter is not so simple as it seems at first sight, and a little study of the conditions on Java will help to elucidate matters. (Map II.)..

Java has ninety species of mammals, fewer than Borneo, and apparently less peculiar. But there are remarkable absentees from Java such as Elephants, Bears, and the Malayan Tapir, all found on Borneo. Of birds there are at least twenty-five genera typically Malayan, which are absent from Java. There are other curious facts: thus there are several cases in which a species occurs on Borneo, Sumatra, and the Malay peninsula, but is replaced on Java by an allied species. But there are also special relations between Java and the Asiatic continent. Thus, a Rhinoceros and a species of Hare are natives also of Indo-Chinese countries, *but not of typical Malaya*. There are five genera of birds inhabiting Java, Indo-China, and Himalaya but not Malacca, Sumatra, or Borneo. The very distinct Javanese peacock only inhabits Java *and* the Indo-Chinese countries.

How can these—and other facts which are too numerous to be given here—be explained?

MAP II.



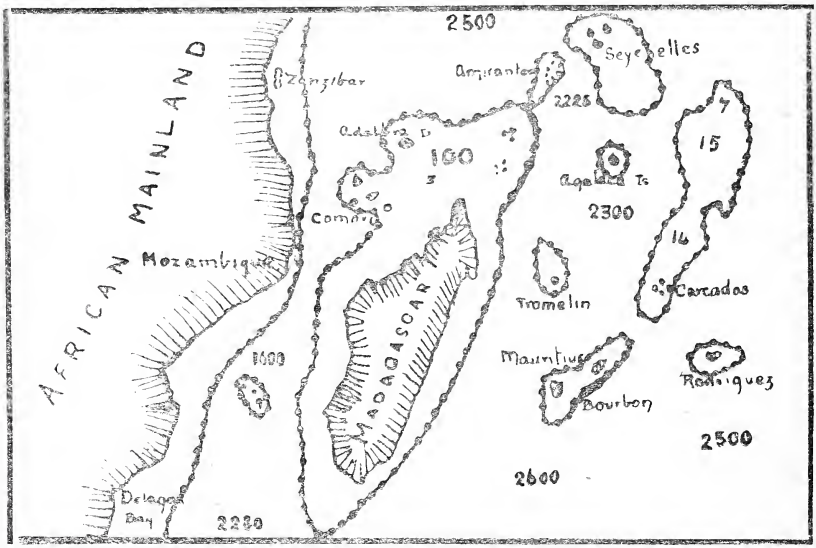
Adapted from two Illustrations of Wallace's in "The Malay Archipelago"

Separates 100 from between 100 and 1000.

Separates 1000 from over 1000.

Depths in fathoms

MAP III.



THE MADAGASCAR GROUP, (after Wallace)

Boundary between depths under and over 1000 fathoms.

Figures show depths in fathoms.

Java and Sumatra are mainly volcanic, but not entirely, for in Sumatra are extensive tertiary rocks of Eocene age overlain by beds of coal through which the volcanoes have burst. In the southern part of Java there are rocks of Miocene age: that is to say they are of later date than the tertiaries of Sumatra which were above water, while the Javanese rocks were still being deposited under water.

In the Miocene age Java was probably three thousand feet lower than at the present time and entirely submerged, while Sumatra and Borneo were fragmentarily represented by a few small islands. Elvation at a later date raised these so that the whole became united with the continent. When the northern hemisphere was cooled by the glacial epoch a few Himalayan species of birds and animals may have found their way into suitable parts of the whole area. Java then became separated by subsidence, so that the visitors were imprisoned, while those in the remaining parts could again migrate northwards and follow the cooler climate as the glaciers receeded: the equatorial forests being unsuited to creatures from the cooler climes of the Himalayan area, but more suited to the typical Malayan fauna. At a later date, the subsidence continuing, Borneo and Sumatra would have been separated from each other and from the continent, so that on each island specialisation would continue, but they would contain few of the continental species still left on Java.

In such a way does the study of animal life and its distribution help us to understand past changes in geography.

When dealing with the Malay region it is extremely interesting to note that in the chain of islands running eastwards from Java we gradually approach the north coast of Australia. The next isle to Java is Bali, then comes Lombok, and beyond Lombok some half dozen more, ending with Timor, the Aru islands, and New Guinea. (Map II.).

Now one end of the chain, Java, is typically Oriental in its fauna, the other, New Guinea, as typically Australian, and it was one of Wallace's masterpieces of natural history to discover that between the small islands of Bali and Lombok, a most definite line of demarcation runs, which has been aptly termed Wallace's line. The fauna on islands to the west of this line is mainly derived from the Oriental region, to the east, from the Australian region. In Wallace's great work " The Geographical distribution of animals," a very full account of this wonderfully interesting difference is given, but as I have not a copy with me at the moment a quotation may be made from the same author's " Island Life."

" In the Malay Archipelago there are two islands named Bali and Lombok, each about as large as Corsica, and separated by a

strait *only fifteen miles wide at its narrowest part.* Yet these islands differ far more from each other in their birds and quadrupeds than do England and Japan. The birds of one are extremely *unlike* those of the other, the difference being such as to strike even the most ordinary observer. Bali has red and green Woodpeckers, Barbets, Weaver-birds and Black and White Magpie-robins, none of which are found in Lombok, where, however, we find screaming Cokatoos and Friar-birds and the strange mound-building Megapodes which are all equally unknown in Bali."

There can hardly be a better example of the fascination of the study of the distribution of animals and the unexpected results to which it leads, so different from what might have been expected from a study of the map.

A study of purely geographical features would leave anyone hopelessly confused who tried to draw a line between Asia and Australia: zoology says clearly that the line lies between Bali and Lombok.

Let us now turn to another of the great Malay islands, Celebes, whose peculiar shape makes it readily found on a map: it lies between Borneo and the New Guinea group of islands; that is, it has on its west the Oriental fauna, on its east the Australian fauna.

The Asiatic isles are bounded to the east by a submarine bank, mostly less than fifty fathoms below the surface, stretching out from the Malay Peninsula as far as Java, Sumatra, Borneo, and the Philippines. Eastwards another bank unites New Guinea and the Papuan isles with Australia.

The zoology of Celebes is peculiar and it cannot be said to belong definitely to either Oriental or Australian regions. There are on this island only forty-four terrestrial mammals, so that there is a great contrast with Borneo. Twenty-three of these mammals are peculiar to Celebes; of those species not peculiar the greater number are found in the Malayan region and the Asiatic continent, but there are several peculiar mice and two marsupials (Phalangers, or Australian Opossums), which must have come from the Australian region.

Indications of isolation and extreme insular antiquity are the facts that the fauna on the whole is poor in species and that while the arboreal rodents are better represented than most other orders there is a large proportion of peculiar species. The fact that there are peculiar species of monkeys and squirrels which here reach the farthest extension of these groups in the eastern tropics, and the two marsupials which here represent the farthest extension westwards of this group, illustrates well the double origin of life on Celebes. Moreover, Celebes possesses three large animals not closely allied to any species found

elsewhere in Asia! One is a tail-less, black, baboon-like ape; another, the Anoa, which is in some degree transitional between antelopes and buffalos, and the third is a most monstrous form of pig called the Babirusa whose great upturned tusks find their nearest analogy in the African Wart-hog.

There seems thus to be a certain indication of affinity with the Ethiopian region, the headquarters of the antelopes and the only part of the world where Baboons and Wart-hogs are found; but this does not necessarily imply land connection. These three animals are of probably ancient types which have been preserved in Celebes by long isolation but in Africa gave way to the more specialized descendants of the present day. It is therefore clear that Celebes must have been separated from the great northern continent at a much earlier date than Borneo, Sumatra or Java, when the more primitive animals held sway. But why did so few obtain access to the land which now forms the island of Celebes? Possibly the connection was so poor, so incomplete, or lasted for comaparatively short a time that only a few animals found their way across narrow straits.

This supposition is supported by study of the birds. As with animals there are peculiar types indicating long isolation but also there are lacking so many of the important Oriental families that it is impossible to suppose that Celebes can ever have had broad connection with the main mass of Asia, but that at long ages past a few forms found their way across a narrow strait or by a chain of islets.

Celebes can thus not be claimed as a Continental island as strictly as Borneo or Great Britain, in so far as possible connection with Asia is concerned. But the same arguments hold good against extensive land connections with Australia, for of all the hosts of marsupial animals in Australia only two small arboreal forms occur in Celebes which might easily have been carried across on trees uprooted by floods or earthquake disasters. The Australian members of the Ostrich family (Emu, Cassowary) never reached Celebes.

Among insects, the butterflies of Celebes have some well-marked peculiarities. Many of them, belonging to different families, show a peculiar arched shape of the front margin of the fore-wings at once distinguishing them from their near relatives elsewhere and implying prolonged isolation of the island.

The facts quoted above, together with others which need not be given in detail here, thus suggests that Celebes is a fragment of the great eastern continent of byegone ages—perhaps of Miocene date—which has preserved little altered some remnants of its ancient animal life. As Wallace says: " there is no other example on the globe of an island so closely surrounded by other islands on every side yet preserving such a marked individuality in its forms of life."

We now turn to the study of the history of Africa in the view of light thrown up on it by zoology, in particular that of Madagascar and the neighbouring islands. It will be remembered that Africa lies in two zoological regions; north of the tropic it is Palaearctic and has relations with Europe; south of the tropic it forms the Ethiopian region whose characteristics have been already broadly outlined. (Map I.).

Soundings of the Indian Ocean around Madagascar and its neighbours show that Madagascar and the Comoro Isles lie on a bank only one thousand fathoms below the surface so that an elevation of that amount would immensely narrow the Mozambique channel to about a quarter of its present width (Map III.). In passing it may be said that an elevation (or depression) of part of the earth's surface for six thousand feet is perfectly possible, as shown by geology in many parts of the world—the Alps, for instance, and the Andes of South America, where strata are found which must have been laid down beneath water.

North of Madagascar, the Seychelles and some other islands lie on another very extensive bank marked by the thousand fathoms line. To the east there is another bank marked out by the same line almost as large as Madagascar itself, and south of that, and due east of Madagascar lies another bank enclosed by the thousand fathom line and containing the islands of Bourbon and Mauritius. These two however are separated from Madagascar, as is Madagascar from the mainland, by a channel of over one thousand fathoms depth which due east of Madagascar exceeds two thousand fathoms.

To the north-east of all these and across the Indian ocean are the Chagos and Maldive archipelagos: coral islands that possibly mark the position of other bygone islands now sunk beneath the sea which, with those already mentioned would form a series of stepping-stones between Africa and India. (See Map I.).

Before considering the fauna of Madagascar in particular let us consider some families of the animal kingdom which the Ethiopian region shares, or does not share, with other regions of the globe.

The Camel family is well-known in geographical Africa at the present day, but does not occur, broadly speaking, in the Ethiopian region. (As a matter of fact there are no *wild* Camels anywhere in Africa: the present day African Camel is always domesticated and its origin is " wrap in mystery "). But they are represented in Asia, and in South America by the Llamas).

Bears, similarly, occur in the Palaearctic region, also in the Oriental, Nearctic, and Neotropical regions, but are absent from the Ethiopian. The Ostrich family is represented in the Ethiopian, Neotropical, and Australian regions but not at the present day, in the

Oriental or Palaerctic regions, though fossil members of the family are found in India, Russia, and Greece. As regards Camels, fossils show that they were a very important group in byegone days, and especially abounded in America. Asia has for all time been so close to America that it is not surprising that the Camels should range into the Palaearctic region which, it must be remembered includes *north* Africa. But, apparently, at the hey-day of camel life their transit further south into Africa was denied by the existence of a broad sea covering what is now the Sahara.

The Bear family, similarly, appears to have ranged widely over the old and new world but at a time when the Sahara sea prevented access to the Ethiopian region. Otherwise was it with the Ostrich family which ranged all over the world at a time when free access from north to south Africa was possible, and it occurred in all the great regions

The somewhat curious distribution of the Antelope family shows that whereas the ancestors must have entered Africa at a time when there was free communication with Asia (for there are several antelopes in Asia and one in North America) their extraordinary development in the Ethiopian region shows that before the family reached its zenith the Sahara was submerged and the southern forms were left to develop along their own lines, secure from competition by their near relatives the sheep and goats and more remote cousins the deer, which never reached Ethiopia although found in Palaearctic Africa.

Presumably a similar chronological history accounts for the absence of bear from Ethiopia.

Such are some of the very interesting broad questions of distribution as they affect the Ethiopian region, and they help us to understand the peculiarities of the fauna of Madagascar; the process of isolation from the mainland of Africa seem to have effects analogous to the separation of the Ethiopian region from the great northern mass of land. Madagascar possesses no less than sixty-four species of mammals, which is certain proof that at one time it was part of a continent. Yet with what continent was it united?

The characteristics of Africa are the Monkeys, Great Cats, Wild Asses and Zebras, Elephants, Rhinoceroses, Buffaloes, Giraffes, and Antelopes. But no one of these, *nor anything like them*, is found in Madagascar. Yet the Bears, Deer, and other animals equally characteristic of Asia are also absent!

Investigation of the wealth of animals peculiar to Madagascar shows that the predominant mammals are the Lemurs, lowly organised and primitive members of the order of Primates to which belong man, the Apes, and Monkeys. Although a few Lemurs are found in West

and East Africa, India, Ceylon and the Malay Archipelago, their headquarters are without doubt in Madagascar where they are more abundant than anywhere else in the world, and more numerous than the members of any other order of mammals.

One of the most interesting little Lemurs is the Tarsius of Malay, held by anatomists to represent one of the direct links in the evolution of the human race, owing to the fact that hers for the first time is the anatomy of the visual centres in the brain of a type different from that of lower animals and the same as in the higher monkeys and man.

But Madagascar is not only remarkable for its Lemurs. The order of Insectivora (represented in England by Moles and Shrews) has no less than five genera of a peculiar family which exists nowhere else in the world but in Cuba and Hayti!

The few carnivora are represented by an extremely peculiar and isolated form, the Fossa, having no allies in any part of the world, and by eight Civets whose nearest allies are African.

African affinities are more clearly shown by the presence of a River-hog and a recently extinct small Hippopotamus, both of which might be accounted for a chance transit across the Mozambique channel at a date when it was much narrower than it is now.

As regards birds, it may be briefly said that they exhibit the same peculiarities of presence and absence as the mammalia; that is to say, numbers of the families which seem most characteristic of the African continent are absent, such as Plantain-eaters, Glossy-Starlings, Barbets, hornbills, while out of the total of 150 land birds known to exist on Madagascar, 127 are peculiar to the island.

As regards reptiles, one of the most important families of snakes, the *Colubridæ* is represented in Madagascar by two genera found elsewhere, not in Africa or Asia, but in America, and by another genus found also in China and America. There are also two species of lizards of the family *Iguanidæ* which is otherwise exclusively American, and a genus of gecko found also in America and Australia.

What conclusions can be drawn from these strange facts? The main feature of the fauna of Madagascar is great abundance of a lowly form of mammalian life (Lemurs) coupled with absence of most of the typical higher forms of the African mainland.

Now, study of the life of bye-gone days by means of fossils shows that animals of the Lemur type occurred widely all over the world at a time before the higher types of mammals had been so abundantly developed but while the lowlier Civets and Insectivora were flourishing. In the lower Miocene period of the Tertiary epoch the peculiar family of Insctivora (*Centetidæ*) already alluded to as only found at the

present day in Madagascar and the West Indies, occurred in France. Thus their present distribution is not contrary to the argument that at that time Madagascar could have obtained its stock from Europe through Africa: if the stock had come, for instance, from America, there would not have been Civets which are not found there, nor are they found in fossil forms.

The conclusion is that the animals now isolated in Madagascar are remnants of groups which formerly were much more widely distributed, and in their comparatively lowly state of organisation are only able to hold their own because, since the hey-day of their ancestors the formerly very narrow channel between Madagascar and Africa which their ancestors were able to cross has been so widened by subsidence that the higher types such as Antelopes, big Cats, etc., never found their way across.

Imagine what havoc a Leopard would have made among the Lemurs! Probably at the time when the early forms of Lemurs and Civets were able to find their way across to Madagascar the land that is now Sahara was submerged so that the higher animals were cut off from the Ethiopian region. By the time that the Sahara emerged from the water Madagascar was too far isolated for the big Cats, Elephants, Rhinoceroses, Giraffes, Antelopes, Monkeys, etc., to get to it, although two large, freely swimming animals managed to get to it, viz., a form of Hippopotamus and a River-hog.

Birds show exactly the same thing.

Madagascar is famous for the fossil remains of gigantic birds of the Ostrich family not found elsewhere (*Aepyornis*): they are parallel with the Lemurs, but have not managed to survive to the present day.

The birds which are absent from Madagascar are analogous to those mammals which were prevented from entering it. The Plantain-eaters, for example, are known to have lived in Europe together with the large mammals characteristic of the Ethiopian region.

A certain number of birds in Madagascar are of *Oriental* rather than Ethiopian affinities. This can be explained by the fact that, like many other African and Indian genera, in bye-gone days they inhabited Europe too, for instance the wild Jungle-fowl, the ancestor of domestic poultry, which is found as fossils in France.

Another possibility is that the ancestors of these Indian-like birds found their way across the stepping-tones formed by the Maldive and Chagos archipelagoes and possibly other archipelagoes of the past which are now indicated only by sunken reefs, and then to the Comoro and Seychelle islands and so to Madagascar. (Map III.).

There is not space to enter at length into the peculiarities of the fauna of the islands round Madagascar. The most famous example is that extraordinary caricature of a bird, the Dodo, a very degraded form of pigeon which from long freedom from the attacks of enemies on an isolated island had lost the power of flight and was ultimately exterminated by man so completely and thoroughly that there is not even a stuffed specimen in a museum!! It lived only on Mauritius, and an allied but less specialized form was found on the adjacent isle of Bourbon, and was known as the Solitaire.

Mauritius and Bourbon are both lofty volcanic islands and were probably never connected with Madagascar, but their existing birds show that their ancestors came from Madagascar. The dodo's ancestors probably date back to the Miocene times, that is, the time when Lemurs abounded in Africa and Madagascar was more nearly within reach. It is interesting to note that Bourbon has a snake of the Boa family found nowhere else in the world: its nearest living allies are in Australia!

The Comoro Islands contain a Lemur and a Civet closely allied to those of Madagascar so that these island were formerly more closely connected with Madagascar than they are now.

The Seychelles are more interesting. They stand on a granite bank which is probably a continuation of the main backbone of Madagascar, and are linked with it by an intervening chain of banks and islets; but at the present date they are separated by channels of one thousand fathoms or more. The entire absence of indigenous land mammals show that the Seychelles can never have been actually united with Madagascar. The birds have many peculiarities. Thirteen out of fifteen indigenous species occur nowhere else in the world: their relations are primarily with Madagascar but there are affinities with Indian species. The reptiles of the Seychelles are numerous and three of the seven species of lizards are confined to those islands. The presence of four species of Amphibia (two frogs and two of the peculiar snake-like forms known as *Coeciliadae*), shows that the Seychelles cannot be considered as true oceanic islands.

The general conclusion that can be drawn from a study of the fauna of Madagascar and the adjacent islands is as follows: these remarks are practically a quotation from Wallace's " Island Life."

Madagascar is a continental island of immense antiquity; the Comoros and Aldabra are fragments detached from it. The Seychelles are fragments of another very ancient island which *may* never have been continental; Mauritius, Bourbon, and Rodriguez are undoubtedly three oceanic islands, while in the extensive banks and coral reefs of Cargados, Saya de Malha, the Chagos and Maldive isle we have indications of the submergence of many large islands which may have

aided the transmission of organisms from India. But between and around all these islands are depths of 2,500 fathoms, or more, which render it very improbable that there has ever been a continuous land surface within the periods during which mammals were evolved. This conclusion, founded on study of the form of the sea bottom, is supported by zoological data.

If there had been continuous land connection with India as is supposed by some there should have been on Madagascar some forms of animals which could have entered from India. The Indian forms in Madagascar and adjacent islands are just those that could have passed as by steppingtone from island to island, and their relationships show that many of them came across in late Tertiary (i.e., comparatively recent) times, though others indicate a more ancient connection.

But the mammals which require continuous land connection are absent. The fact that Lemurs, mainly found in Madagascar, occur also in Asia in the Oriental region, is explicable by the fact that the animals of the present day are survivors of a very ancient family widely dispersed from Europe where it existed in very early (Eocene) Tertiary times.

Exactly the same argument applies against the supposed need for a former direct land connection with South America (perhaps via the south polar continent) and Australia. Those animals of Madagascar showing affinity with America, the curious insect-eating *Centetidæ* of Madagascar and Cuba are of primitive type and may well be isolated survivors of a family more widely diffused in previous times, and similarly, the lizards which show affinity with Australia.

The further back in geological history that animals and plants are traced the wider appears to have been their distribution: in the Palaeozoic times the majority of the groups of animals and plants appear to have had a world-wide range.

Wide areas of marine deposits of early Tertiary (Eocene) age show that at that time Africa was cut off from Eurasia by an arm of the sea. But before that Africa, with Madagascar closely connected, had received the early types of mammals, and the ancestors of the Ostriches and their gigantic *Aepyornis* relatives now only known from fossils in Madagascar, and the reptiles and insects of American affinities.

At that time fossils show that all the types of large mammals now found in Africa but absent from Madagascar inhabited Eurasia and many of them (in the middle tertiary period) also North America.

But before the later, continental period in the history of Africa, when the larger animals could have passed across the Sahara,

Madagascar had become separated from the mainland and was able to develop in a particular direction its Lemurs and Ostrich-like birds. From it the adjacent small islands received such animals as could cross over, and in its turn, it received from India, through them, a small proportion of Indian creatures.

I now propose to spend a little time in consideration of interesting facts of geographical distribution brought out by the study of butterflies and more particularly the phenomena known as mimicry. In this matter we have no fossils to guide us, for fossil butterflies do not show the colours on which mimcry depends.

By mimicry is meant, not likeness to twings, rocks, leaves, thorns, etc., which is more accurately known as cryptic resemblance, but the resemblance of one insect to another of a group quite distinct from it in anatomical features, though the degree of relationship may be of all kinds, from the close affinity between species of the same genus to the immense difference between, say, an insect and a spider.

In order to have a mimic there must be a model; this term is applied to the insect which enjoys a relative degree of immunity from attacks of insectivorous animals or birds owing to unpleasant qualities advertised by simple and easily recognised colours and patterns. The mimic has been altered from its former appearance by the action of natural selection upon chance variations which provided a first degree of likeness to some model; this likeness being intensified by selection during successive generations. It is not intended here to enter into a discussion of mimicry as such; it is used here to exemplify some of the facts of distribution. By a curious coincidence, as I was preparing this article, I received a recent publication of the Entomological Society (Parts III., IV., of the Transaction for 1923) in which is a paper on mimicry in the butterflies of Fiji by Professor Poulton, F.R.S., of Oxford.

He produces evidence in support of Wallace's theory of the crossing of birds from India to Madagascar by means of island stepping stones. A family of butterflies possessing all the necesary characters of models is the *Euplœinæ*, very common and widespread in the east, and much mimicked by other butterflies, including species of *Hypolimnas* nearly related to the well-known *H. misippus* common all over Africa and elsewhere.

A very common and widespread species in the east is *Hypolimnas bolina*, which has extended its range from India to Madagascar in the present century. The Indian race of *bolina* was first seen in Madagascar in 1903 and has very rapidly increased its range and numbers throughout the island.

But on the Chagos Islands in the Indian Ocean, far to the north-east of Mauritius and Bourbon is a peculiar race found nowhere

else in the world. Professor Poulton says: " This race must have reached these islands long ago, for the female form is different from any other in the known range of *bolina*, being an evident mimic of *Euplœa euphon* now only known in Mauritius but mimicked by the female of *Papilio phorbanta* in Bourbon and therefore formerly a resident in that island. A glance at the map of the Indian Ocean at once suggestts that this Oriental *Euplœa*, and *E. mitra* of the Seychelles, reached their present localities by way of the Laccadive, Maldive, and Chagos groups and the islands between them; thence westward and south-westward by many other scattered islands. The route of the invading *euphon* clearly passed through the Chagos group, and it is not an extravagant exercise of the imagination to see in the race *bolina euphonoides* the persistent effect of its residence in these islands."

Thus does a type of butterfly which serves as a model leave its footprints in the country through which it passes!

The most widely known mimic in Africa (because the first described example in our continent) is the swallow-tail, *Papilio dardanus*, about which Professor Poulton has written an account especially for this journal.

But as I have said so much about Madagascar in this article, I cannot refrain from pointing out the great interest of this butterfly in connection with Madagascar. The host of forms of female on the continent, all differing from the male and from each other, are quite unrepresented in the race of this butterfly (or perhaps the allied species) named *meriones* which is only found on Madagascar. In *meriones* the female only differs from the male very slightly, and is held to represent the ancient type from which the females of the continent developed along different lines after Madagascar was widely separated from the mainland.

Now let us turn to other examples of the effects produced by a distasteful butterfly which penetrates into some distant country and alters by its presence the appearance of some of the indigenous fauna.

There is, in East and South Africa, a handsome butterfly belonging to the well-known sub-family *Danainæ* but quite different in appearance from the vast majority of its nearest African relatives. This species is a handsome one with a pattern of numerous bright blue spots and streaks upon a black background. Its name is *Melinda* (*Tirumala*) *petiverana*, and it is entirely different in pattern from *Danais chrysippus* or any of the numerous species of *Amauris* which belong to the same family. There are one or two other species of *Melinda* somewhat similar in pattern but brown or cream instead of blue. Now the blue and black of *petiverana* is shown, by a study of geographical

distribution, to be very characteristic of the Oriental *Danainæ*, there being numbers of species in that region nearly resembling *petiverana*.

The distribution of *petiverana* in East and South Africa, and the fact that in those parts it is the only one of its type, is highly suggestive of the conclusion that it is a descendant of some species of this type of colouration that entered Africa from the Oriental region.

The result has been most interesting, and is somewhat similar to the effect upon a human invader! The intruder tends to take on some of the characteristics of the aborigines. But the parallel is not quite fair, for in the case of mankind the assimilation of the invader is due to intermarriage whereas in the case of this butterfly the resulting phenomena are due to mimicry.

In East Africa *petiverana* has held its own and has proved itself to be a model sufficiently powerful to alter the appearance of a common butterfly of the Swallow-tail family, *Papilio leonidas*, so that the *Papilio* has a strong resemblance to the *Danaine*.

But as this *Danaine* intruder penetrated westwards into the heart of Africa it came into contact with a powerful " ring " or combination whose total influence must be immeasurably more powerful: I refer to the typically Ethiopian genus *Amauris*, Danaine butterflies also, but rather distantly related to *petiverana*. These Amauris, black and white, abundant, conspicuous, and distsasteful, have exercised so strong an influence upon the intruder that as it came within their territory it became altered itself, and in West Africa we find, not the blue and black *petiverana* but a much darker, black and white, species known as *morgeni* resembling the dominant *Amauris* pattern of that neighbourhood. These phenomena illustrate remarkably well the complexity of mimicry; in this case the resemblance is of the class known as Mullerian, or Synaposematic; the likeness being between two groups of distasteful butterflies for their common benefit. This is not true mimicry; that term is best reserved for Pseudaposematic resemblance, that is, the resemblance of an edible species to one more distasteful, whereby one lives on the evil reputation of another. Apropos the genus *Tirumala* Professor Poulton, in his paper on the butterflies of Fiji already mentioned, shows that a species of *Tirumala* which found its way into those islands from Asia there met so strong a combination of another section of the Danaid butterflies, namely the *Euplœinæ* already mentioned, that the *Tirumala* has been distinctly altered to resemble the *Euplœa* pattern in those islands where the Euplocine influence is most powerful. These facts have only been made out by laborious study of great numbers of specimens most carefully labelled *by the captor* with exact geographical data: it may be said here, and cannot be too strongly emphasised that any collection of specimens is useless (or worse than useless because possibly leading to error) unless furnished

with the most exact data of time and place. Professor Poulton found a large number of specimens in the National collection at the British Museum quite useless for the purpose of exact study because they were only labelled Fiji and gave no information as to the individual island from which each specimen came.

Another remarkable instance of changes wrought in the indigenous fauna by the intrusion of a dominant species from elsewhere is seen in North America.

Here the invasion appears to have been from Asia by way of the Behring Straits. The very abundant butterfly—perhaps the commonest butterfly in the world—*Danais chrysippus* has already been alluded to: it is orange brown with the black tips of the forewings containing a conspicuous white patch. In Asia there are numbers of Danaines with that general type of colour and pattern, but with the " veins " of the wings heavily marked in black. This colour scheme has its headquarters in Asia, and the Danaines possessing it serve as models for mimics belonging to other groups. An abundant species of Danaine is *archippus*. This, or some ancestor resembling it, has apparently in the far past found its way into Canada and America and become slightly modified to form the species known as *plexippus*. This intruder, exactly as *petiverana* in East Africa, has modified one of the indigenous butterflies of the *Limenitis* (to which the English " White Admiral " belongs) to be a wonderfully close mimic of itslf in two forms. These phenomena show conclusively that mimicry cannot be attributed to similar effects produced on different butterflies by meteorological or other local conditions. Were this so the invading species, being presumably an example of the effects produced by the conditions from which it came (Asia for example) should adopt the living of the inhabitants of the new country. Yet the reverse is the case, and the invader appears to have imposed the effect of Asiatic conditions upon species subjected to American conditions!

Lastly, let us take that most interesting and wonderful Ethiopian butterfly *Pseudacræa eurytus*, belonging to the Nymphaline sub-family, and to that section of it which includes our English " White Admiral." This is perhaps one of the most remarkable species of animal living on account of the variety of forms in which it exists, which until quite recently were all thought to be different species. The first known form was described by the great Linnaeus in 1878 from the West Coast, but the total number of distinct forms is not yet known, for new ones are constantly being discovered. The energetic secretary of this society has within the last few months obtained a new form from near Marsabit, by which the known range of *eurytus* has been enlarged to the north.

This butterfly is found in forested country from West Coast to Mombasa and from the northern border of Kenya through Tanganyika Territory, Nyasaland and Natal to Pondoland. There are wide gaps in its distribution, however: for instance, between the Uganda-Kenya border and Rabai near Mombasa I am not aware of the existence of any forms.

While the headquarters are undoubtedly in West Africa where it exists in great variety, there are several forms in Uganda, some of which are not found in West Africa. Some of the forms are confined to the male sex, others to the female, others again occur in both sexes, but, in Uganda at any rate, all these can interbreed one with another.

Until Dr. van Someren's valuable recent discovery only two forms were known in Kenya, from near Mombasa, male differing from female but both distinct from forms occurring anywhere else. In Tanganyika Territory occur a male and female, also different from each other and from anything else: similarly in Nyasaland. In Natal, however, male and female are less different from each other and one form of female resembles the male: these again are not found elsewhere. The single specimen that is known from Pondoland is again different. Taking the number of forms in Uganda as ssix, we must allow at least twice as many for the West Coast, so that there are at least thirty quite distinct forms of this one species of butterfly.

Imagine thirty animals each of which was really a lion; yet differing from each other as much as the lion, leopard, puma, jaguar, and other big cats which must be imagined!

There is only one explanation of these facts, this is mimicry. Every form of the one species of *Pseudacræa* is a mimic of some *species* of butterfly of an extremely different family, the *Acræinæ*, which have already been mentioned as so characteristic of Ethiopia. The models are species of the genus *Planema* and we find that in localities where the model is sexually di-morphic—as far instance in Kenya at Rabai—the mimic copies it sex for sex; where male and female *Planema* are alike as in two species serving as models in Uganda, the forms of *eurytus* that resemble this species are also monomorphic.

It is interesting here to note that *Pseudacræa eurytus* does not occur in Madagascar: evidently is has developed along its own lines since the wide separation of the island from mainland. But the genus *Pseudacræa* does occur on Madagascar, only the few species are non-mimetic. Now the occurrence of *Preudacræa eurytus*, a forest loving species, over such a wide area is evidence that in former times the type of forest it requires was probably much more continuous than at the present day. We know even within our own experience the havoc wrought by native methods of cultivation and fires, and it

seems quite probable that in the presence of this butterfly at Marsabit for instance we have an indication of much more extensive forest connection with the west coast than exists at the present day. The peculiar forms of Nyasaland occur on the isolated Mount Mlanje, which may be regarded as a continental island of forest isolated by a sea of more open country.

In fact, the present discontinuity of distribution in Africa of *Pseudacræa eurytus* shows the same phenomena, from which the same conclusions can be drawn,, as the world distribution at the present time of such a group as camels and ostriches.

Finally, it may be said that this article has been written to stimulate enquiry into, and collection of data bearing on, the subject of distribution of living things over the surface of the globe. Such studies cannot be pursued without collection of large numbers of specimens, but such specimens are worse than useless unless accompanied by minutely accurate data of time and place. The ideal museum has been described as " an interesting collection of labels illustrated by specimens." But at the back of every display there should be a store of great numbers of specimens from the whole area inhabited by each for the purposes of scientific study. One or two specimens of any species tell us very little about the wider facts of its life and environment.

EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY.

Annual Report, 1924.

The progress during the year has been slow and steady and perhaps, on the whole can be said to have been fairly satisfactory. Improvement has taken place, no so much in regard to increase of materials or exhibits, but financially.

The most noteworthy event of the year was the entire wiping off of the debt on the Museum building. This was brought about by the assession of special funds resulting from the exhibition of the wonderful Game Film presented to the Society, through Government, by Mr. Martin Johnson. The judicious exhibition of this film should prove a useful source of revenue for some years to come. The Society had the honour of showing this film before Their Royal Highnesses the Duke and Duchess of York.

A further advance in the development of the Museum is the degree of Governmnt recognition secured during the year. At the invitation of our late President and Governor, Sir Robert Coryndon, your Committee addressed Government on the subject of a grant to the Museum. This appeal was sympathetically considered and resulted in a sum of £150 being included in the 1925 Estimates and approved by the Colonial Office.

A further indication of our late Governor's interest in the Museum was the ready response to the suggestion that the Parliamentary Commission should visit the Institution. Sir Robert himself conducted Major Church over the Museum, fully explaining the difficulties under which the Society was labouring. Major Church expressed himself as extremely interested and promised to advance the claims of scientific work in this country, as opportunity offered. Following on this visit, and at the invitation of Major Church, attempts were made to sufficiently organise the scientific workers in this country, both Government and private, to draw up a memorandum outlining the great need for scientific research in the country and the great desirability of increasing the Government scientific staffs and the making of provision for services not yet provided for. This Memorandum was submitted to the Commission and to His Excellency.

The establishment of a great central Scientific Institution of which this Museum will form a part is the goal towards which we press.

The Museum has now become possessed of a Bronze Bust of the late Capt. F. C. Selous. This is the gift of the late Sir Northrup McMillan, to whom the Society has so often been indebted in the

past. The Bronze was unveiled by our late Governor on January 19th, 1925. This indeed was his last public act.

The Museum has also received from Mrs. Cook a large collection of Birds and Game heads got together by the late J. Pemberton Cook.

A Mosquito survey of Nairobi township was completed during the year, and as a result the Museum will shortly have a named series of the fifty or so species known to breed within the Municipal boundaries.

Through the kindness of Government, the Society has secured a very fine pair of Elephant Tusks—reckoned to be the third longest on record.

Numerous additions have been made to the Insect collections, but owing to lack of room and funds, nothing outstanding has been added to the exhibited material.

Towards the beginning of the year the Forestry Dept. kindly offered to loan the Society an exhibit of local Timber. This offer was accepted, and the display, although not representative, is of considerable value and interest. A great deal more co-operation between Government Departments and the Museum is desirable, in order that the public may have the opportunity of obtaining an insight into Government activity in economic matters and of viewing the results therefrom. The co-operation of the Native Affairs Department is especially desirable in obtaining permanent records of native customs, implements, ornaments, etc., etc., before these are entirely superceded by western ideas and lost for all time.

The example of the Forest Department might well be followed.

Five ordinary general meetings were held during the year, and one afternoon lecture was arranged for the Boy Scouts. After full consideration, the form of the Journal was changed during the year. The Magazine now appears every quarter, and though each number is of reduced bulk, compared with previous issues, the aggregate for the year will be considerably larger.

Two special Journals were issued; one being a Check List of Reptilia, the other a special appeal inviting membership of the Society, and contributions to its funds.

The Illustration Fund has received more support during the year than hitherto. The Society is indebted to Professor Poulton of Oxford for much kind help and particularly for the generous gift of coloured and half-tone Plates for the Journal, and for a large number of entomological Store-boxes.

The Museum is still without a Curator, and this has limited the growth of actual new exhibits to a minimum. Certain specific groups have been worked at by your Hon. Curator, and special

families of Insects have been reported on by authorities in England and elsewhere.

The financial Statement attached shews a surplus credit over liabilities of Shs. 2,015-13, in spite of the heavy drain on general funds in respect of repayment of loan and cost of Journals.

The future progress of the Museum is dependent on generous financial aid from Government and the Municipality.

There are 230 names on the Membership Roll, but only 184 members renewed their subscriptions in 1924.

EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY.

Balance Sheet, 1924.

	Shs.	Cts.		Shs.	Cts.
To Wages	213	00	By Subscriptions	6,093	30
,, Rent of plot	60	00	,, Subscriptions in advance ...	49	50
,, Loan and interest	4,325	38	,, Donations and refunds ...	3,071	00
,, Insurance	152	00	,, Sale of Journals	160	00
,, Lighting	48	00	,, Visitors to Museum ...	327	00
,, Cost of Journals	2,137	20	,, Balance at Bank as at Dec. 31	1,197	59
,, Advertising	357	90	,, Cash Balance on hand, 1923	13	90
,, Museum expenses, lectures ..	1,080	54			
,, Bank charges	3	70			
,, Returned cheques	63	20			
,, Cash stolen from Museum ...	45	00			
,, Secretary's expenses, stationary, Stamps, etc.	298	70			
,, Petty Cash	13	90			
,, Balance at bank at Dec. 31 .	2,015	23			
	10,912	29		10,912	29

BUILDING FUND.

Paid from General Revenue ...	1,625	32	Loan and Interest due to T. A. Wood, Esq.	4,325	32
Proceeds from Film	2,600	00			
Donations (special)	100	00			
	4,325	32		4,325	32
			Balance due ...	Nil.	

The Journal
OF THE
EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY

October, 1925. *No. 23.*

CONTENTS.

EDITOR OF JOURNAL:

Dr. V. G. L. van Someren.

Additional copies to Members, Shs. 5/-; to non-Members, Shs. 10/-

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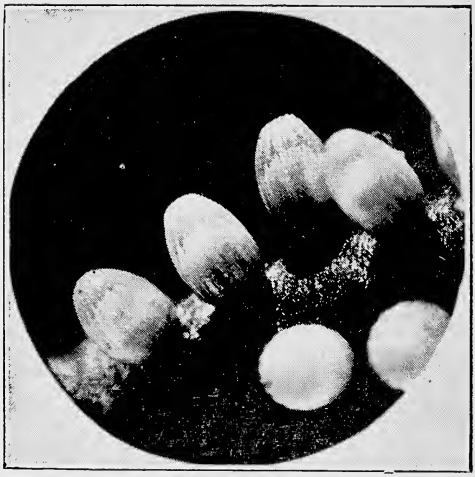
The Journal

OF THE

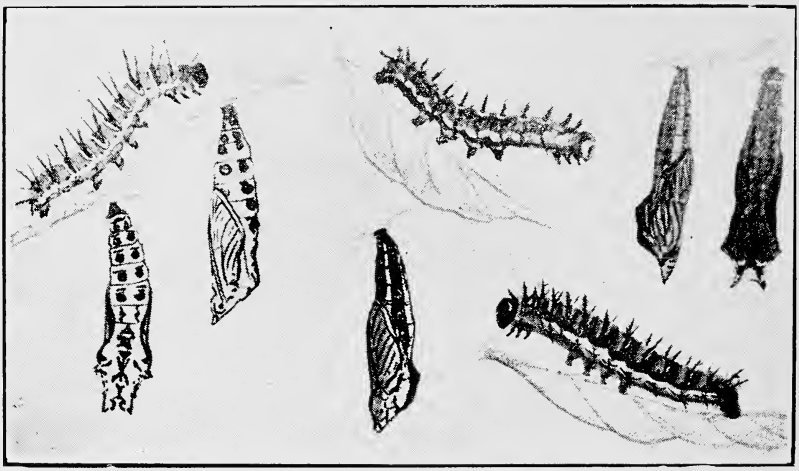
East Africa and Uganda Natural History Society

October, 1925. *No. 23.*

FRONTISPIECE.



Eggs of Acræa cerasa. X 10.



Typical Acræine larvæ and pupæ. Natural size.

THE BIRDS OF KENYA AND UGANDA.

Part II.

Family.—PHASIANIDAE.

Genus.—PTERNISTES.

Bare-throated Francolins, or "Spur-Fowl."

Francolins of the Genus *Pternistes* are readily distinguished from those of *Francolinus* by the absence of feathers on the throat and upper part of the fore-neck, and the presence of a large area of bare skin round the eye. The majority of *Pternistes* have either one or two pairs of stout spurs of more robust build than found in *Francolinus*.

Pternistes afer leucoparaeus, Fisch. and Reichw. Coast Red-throated Francolin.

Ref. Fisch. and Reichw. J.f.O. 1884, p. 263.

Type locality, Kipini.

Distribution: Coastal region of Kenya, from Witu to Vanga.

Description: Male, Adult.

Top of head ashy-brown shading to black on the forehead, each feather with a dark centre.. Mantle, scapulars and coverts of wing ashy-grey, with dark brownish shaft-streaks. Primaries and secondaries umber-brown, the former with pale outer webs, the latter with a slight amount of freckling towards the ends. Cheeks black; ear-coverts brownish; a trace of black and white supercilium; sides of head, side and hind neck and lower throat white, each feather broadly black along the shaft. Upper breast ashy-grey inclining to white on the lower breast and flanks, the feathers on the two first areas with black shaft-strokas, those on the last with black margins and black central stripe. Part of the lower breast and abdomen black. Vent and under tail-coverts ashy-brown. Thighs black and white internally, ashy-brown externally. Rump and rectrices umber-brown; under tail-coverts ashy-grey with whitish freckling and dark shaft-streak. Bare skin round eye and on throat blood-red; bill and legs coral-red.

The immature male answers to the above description except that the black of the underside is mottled with white, as also is the belly. The feathers of the rump, tail, and secondaries are heavily speckled and somewhat barred.

FEMALE:

Bears a general resemblance to the male, but the feathers of the cheeks, sides of head and feathered portions of the neck are white with black centres. The lower surface less black, each feather having a white shaft with a white tip.

JUVENILE:

The chick in down is unknown to me, nor does there appear to be a published description. The young in first feather is as follows: Top of head brownish; cheeks, throat, neck and upper breast whitish with broad black centres to the feathers. Undersurface of body mottled black and whitish becoming brownish on the lower part of abdomen and at vent. The back is ochreous-brown, heavily mottled with black and dark brown. The feathers of the scapular region and all the secondaries are speckled and barred with brownish-black. The outer primaries have ochreous margins to the outer webs profusely stippled with brownish-black. Bill and legs horn-brown.

HABITS:

The Coast Spurfowl is found in pairs or small coveys of four to six individuals, in the vicinity of forests or in thick bush. They are very shy and keep to thick cover during the day and are difficult to discover without the aid of a good dog.

In the early morning and towards sunset they leave cover and are found in the more open bush and grass lands. If flushed, they give quite good sport, but like all Spur-Fowl they take fright at the slightest provocation and go to cover immediately, trusting to their remarkable running powers rather than to flight.

The flight is strong, but not sustained, and refuge is sought in the nearest tree with promise of sufficient shelter.

The nesting seasons are not clearly defined but correspond more or less to the latter part of the rains. The nest is a shallow depression in the ground, sparsely lined with grass, and the site chosen is under a stunted bush or thick grass at the edge of the forest or bush country. Five to eight eggs are laid, creamy-brown in colour with fairly distinct pores and with a matt surface. They are slightly more pointed at one end. Size, 40 x 30 mm.

Both parents take part in incubating, and are very close sitters. A sitting bird is very difficult to see, so closely does its colour harmonise with its surroundings.

Pternistes cranchi intercedens, Reichw. Uganda Red-throated Francolin.
Ref. Reichw. O.O. XVII, p. 88, 1909.
Type locality, Lake Rukwa.

Distribution: Uganda, from Elgon to Ankole, and Ruwenzori.
DESCRIPTION: MALE, ADULT.

Top of head dark brown shading to black on the fore-head. Eye stripe if present, black and white. Cheeks blackish becoming on the side of the head, black and white. Ear-coverts brownish with slight white striation. Throat and area round eye, crimson red. Feathers of neck, upper mantle and breast, white, with dark shaft-streaks and black vermiculations.. Mantle, rump, upper tail-coverts and rectrices umber-brown with darker shaft-streaks and fine dark-brown vermiculations. Wing-coverts as mantle. Secondaries umber-brown vermiculated, the inner ones with a darker brown oblique patch on the inner web. Primaries ashy-brown with paler vermiculations on the edge of the outer web. Feathers of breast, flanks and abdomen, greyish-white with darker shaft-streaks and very fine blackish vermiculations and wide bright chestnut edges. Thighs greyish-brown, externally and internally with fine vermiculations. Vent greyish, slightly barred. Under tail-coverts ashy-grey with darker brown centres and finely vermiculated. Bill and legs crimson-red.

FEMALE:

Very like the male but with the bare areas less extensive; the lower surface with less chestnut; and the scapulars and inner secondaries with coarser vermiculations. Bill and legs red.

IMMATURE.

Somewhat similar to the female, but more distinctly vermiculated and barred especially on the mantle and inner secondaries, and more whitish below, with fewer but coarser dark vermiculations and darker and wider shaft-streaks. The chin and most of the throat sparsely covered with blackish, white tipped feathers. Bill and legs brownish.

JUVENILE:

The chick in down is hard to distinguish from that of *Francolinus squamatus*, it is however darker chestnut-brown on the back; the eye-stripe is wide and buff in colour. The whole of the under-surface is sandy-buff, slightly darker on the breast. There are two wide buff lines running from the scapular region to base of the tail. In first feather the mantle feathers are dark brownish with pale tips, darker brown centres and wavy lines. The feathers on the under-side are whitish with coarse stippling and vermiculations and dark shaft-lines.

HABITS:

This Francolin is essentially a bird of the scrub and acacia country, frequenting the overgrown dongas and bush-fringed water-courses. During the heat of the day it lies up and is seldom in evidence, but as the sun nears the horizon it begins to stir. In a district frequented by these birds it is no uncommon thing to hear, just at sunset, three or four cock birds uttering their hoarse penetrating cry "Kareek, kareek," repeated several times in succession. With care one can approach a calling bird, and invariably he will be located standing on some prominent position such as an ant-hill or mound; so intent will he be on producing as great a volume of sound as he is able, that a careful stalk will meet with success; a false move, and he will suddenly stop his calling, slip off his mound and vanish into the grass like a flash. One may then tramp over the spot where he should be, but lucky is the hunter who puts his bird up without the aid of a dog! There are times however, when one may chance on these birds suddenly; they will then take flight, but not go far and when once alighted on the ground they run to cover and lie close.

I have never come upon a large covey of these birds but have usually seen them in pairs or very small coveys of four or so.

It is undoubtedly more common in the Toro and Ankole districts than elsewhere in Uganda, and is restricted to the lower altitudes.

Like most Francolin, the chief diet consists of roots, soft shoots, seeds and insects.

The nesting season, so far as my records show, appears to be during the months from April to July and in October. The nest is a shallow depression under a tuft of grass or stunted bush, lined sparsely with bits of grass, and fairly well concealed.

The eggs are a blunt oval with a finely pitted though not rough surface, and pale to deep buff in colour, measuring roughly 34 x 39 mm.

Pternistes granchi böhmi, Reichw. Kenya Red-throated Francolin
Ref. Reichw. J.f.O. 1885. p. 465.

Type locality, Igonda, Tanganyika Territory.

Distribution: In Kenya; South Kavirondo, and Loita; and has been recorded from Elmenteita and Tana.

DESCRIPTION: MALE, ADULT.

Very like *P. c. intercedens* but with the breast and belly feathers purer white and with clearer vermiculations, the feathers on the latter area having blacker shaft stripes and wider chestnut margins. Bare area round eyes, and throat, orange scarlet. Bill and legs red.

The immature bird has the mantle and the wings (except the primaries) brownish with wavy lines of ochreous and dark brown, and has the underside of the body whitish, the feathers having transverse vermiculations of dark-brown and blackish.

Habits:

This eastern race does not differ in habits from the form inhabiting Uganda.

Pternistes rufopictus, Reichw. Grey-breasted Red-throated Francolin.
Ref. Reichw. J.f.O. 1887. p. 52.
Type locality. Wembere Flats. Tanganyika Territory.

Distribution: Western Uganda, Bunyoro to Ruanda.

Description: Male, Adult.

Top of head dark brown with darker centres and pale ends to the feathers. Superciliary stripe, black above, white below. Bare parts of head and neck outlined in black. Fore-neck grey, rest of neck black and rufous, with white centres. Undersurface of body including breast, flanks, and abdomen, white with broad rufous edges and black shaft-stripes. Belly greyish white. Hind-neck feathers with white edges. Feathers of mantle and coverts grey in centre, with blackish brown shafts and wavy transverse bars. Rump, upper tail-coverts and tail, greyish, with wavy transverse bars. Wings dark brown with paler more rusty cross bars. Naked parts, round eye orange red; on throat, orange-yellow. Bill reddish-brown, legs brown.

Juvenile Plumage:

This is unknown to me.

Habits:

Similar to *P. c. böhmi.*

Pternistes leucoscepus infuscatus, Cab. Common Yellow-throated Francolin.
Ref. Cabanis, J.f.O. 1868, p. 413.
Type locality, Lake Jipe.

Distribution: The thorn-bush country of Kenya, from Taru and Teita through Ukambani and Southern Masai to the Kikuyu country; foothills of Kenia and Lake Baringo.

Description: Male, Adult.

Top of head ashy-brown with darker centres to the feathers. Forehead laterally white continuous with a black and white superciliary stripe. Cheeks and side of head white, the feathers of the latter with

brownish shaft-streaks. Ear-coverts brownish. Feathers on hind-neck white with broad blackish-brown centres, those of the lower neck, breast, mantle, back and wing-coverts blackish-brown shading to rufous at the centre, and with cream shaft streaks which gradually widen out towards the tips of the feathers. A certain amount of fine speckling is present on the mantle and secondaries. Long feathers on flanks, dark-brown, with rufous tinge at shaft, wide creamy-white margins, and a triangular white spot at tip. *Practically no white along the shafts.* Secondaries brownish with greyish edges to the outer web, and vermiculations of ochreous, especially outwardly. Primaries brownish with a large creamy patch on the inner web, and with a slight edging of the same colour on the outer web. Lower abdomen and vent ashy-grey with broad whitish tips to the feathers. Thighs whitish with dark centres. Rectrices ashy-brown vermiculated with ochreous buff.

Bare area round eye orange-red; chin of the same colour shading to yellow on the throat and fore-neck.

Bill and legs horn-brown; gape reddish. Nostrils red.

Immature Male:

Very like the above but with the feathers of the breast, mantle, back and coverts with broad triangular spots at the ends of the shafts, and with the inner secondaries more bodily vermiculated so as to be almost barred.

Female:

Similar to the male on the underside, but on the upperside much more vermiculated, especially on the scapulars and inner secondaries.

Young birds in second feather have the underside rather more striped than spotted, due to the whitish centres of the feathers being almost as wide as the dark margins. The secondaries, rump and tail are more transversely barred and the pale vermiculations are broader.

The " Cheeper " in first feather is light brownish above, boldly spotted and vermiculated with ochreous brown, and is whitish below—the feathers on the breast decorated with lines of broken spots and streaks.

The chick in down is dark chestnut on the head, with a pale sandy superciliary stripe. The back is mottled dark and lighter brown, with a certain amount of blackish mottling along the dorsum. The whole of the underside is sandy buff, slightly more ochreous on the chest.

Habits:

The common " Spur-Fowl " is found in the neighbourhood of native shambas, and bush country and in grass-lands where there are stunted bushes to give cover. A favourite locality to find them in is a bush-fringed donga or dried-up watercourse. They are also very partial to the stony hillsides where stunted olives and other trees abound. In the early morning, just at daybreak and for an hour or two afterwards the cock birds start calling, their harsh grating " koarek koaree " being heard at a considerable distance. Calling again takes place in the evening; and it quite common to hear the birds call just before and particularly after rain. Both male and female have the same call, but the latter is less frequently heard.

The " Spur-Fowl " feeds chiefly in the early morning and again at evening. During the heat of the day they lie up close in thick cover and are difficult to find without a good dog.

They are very partial to patches of native tree-beans and potato and may here be seen in small coveys of six to ten busily scratching amongst the leaves and debris. They love scratching up and turning over the low piles of wilting weeds which natives leave betwen the rows of growing beans; such places team with insect life. Like most gallinaceous birds these Francolin are very fond of a sand bath; and in the old days it was no uncommon sight to see several birds thus engaged along the Fort Hall Road.

A tree to a Spur-Fowl is a place of safety—flush your birds, and if there is a tree nearby, they will go into it; they then sit tight and very often one has to get a beater to throw stones into the tree or shake it before the birds will break cover. I have known of " Koari " being taken by hand by a native who quietly ascended a tree and captured the birds as they sat hid in the thick foliage. These birds give fair sport if walked up with dogs, or driven with beaters, but they are loth to take wing. Their running powers are marvellous and even when going at a good speed they carry the body very erect.

Their food consists largely of insects, grain, roots and green stuff. They do a certain amount of damage to growing maize, but this is more than compensated for by the amount of injurious insects they devour.

The nesting season is prolonged and dependent on the rains to a considerable extent. My records shew that eggs have been noted in the months of February to July and again in October and November, while chicks have been seen in practically all months of the year.

The nest is usually to be found under a bush or in dense grass. A shallow depression the earth suffices, to which a few bits of grass are added. The clutch varies from five to eight, very occasionally more;

in colour the eggs are pinkish-buff finely freckled. Size 45-47 x 35-40 mm. The parent bird sits closely. The maternal instinct is well developed and the defence which a hen puts up in protection of her chicks is not unlike that adopted by the ordinary " barn-door " fowl. She will attack and fly at a dog or small Mungoose, but if a human being disturbs her she will adopt the broken wing stunt and will flutter along the ground away from the crouching chicks in an endeavour to attract attention from them.

The foregoing notes apply to the race of Spur-Fowl which is most widely distributed in Kenya, we have yet to consider the other named races of *Pternistes leucoscepus*, which occur within the limits covered in these notes.

The late Dr. Mearns recognised the following:—

Pternistes leucoscepus keniensis, Mearns. Mt. Kenia Yellow-throated Francolin.

Ref. Mearns, S.M.C. Vol. 56, No. 20, p. 1, 1911.

Type locality, Slopes Mt. Kenia, 6,500 ft.

Distribution: Between 6,000 and 7,000 ft. on Kenia.

DESCRIPTION:

" Differs from *P. l. infuscatus* in its generally darker coloration; in the absence of transverse bars on the wings and tail, which instead of being barred are minutely speckled and vermiculated; in the much narrower white borders of the feathers of breast and sides, *those of the flankks having white shaft-stripes;* and in having the thighs and crissum darker and without pure white edges."

Pternistes leucoscepus kilimensis, Mearns. Ref. Mearns, Op. cit.

Type locality, Mt. Kilimanjaro.

DESCRIPTION:

Said to differ from *keniensis* to which it is most allied in having a more " castaneous tone of colouration "; " the light specklings of the wings and tail and the shaft-streaks of the mantle and wing-coverts are chestnut or rust color instead of grayish or buffy white; the concealed pale markings of the wing-quills are decidedly rusty instead of nearly white, the white edgings to the feathers of the breast and sides have the chestnut colour extending to the subtriangular white spots at the tips of the feathers."

I have quoted these descriptions at length because I am not prepared to deny the validity of these races. Recent writers, including W. L. Sclater in Systema Avium Aethiopicarum, 1924, p. 92, and myself in Novitates Zoologicæ 1922, p. 26, have cast some doubt on the validity of *keniensis* and have declared *kilimensis* to be unsound. The lack of topotypical examples prevents me from expressing an opinion now. There seems to me to be no reason why there should not be a local race on the higher altitudes of either Mts. Kenia or Kilimanjaro, and though the type of *infuscatus* came from near Kilimanjaro, it must be remembered that this locality is included in the low-lying scrub and thornbush zone which differs considerably from the alpine conditions of Kilimanjaro.**

A further race occurs within the Kenya boundaries as follows:—

Pternistes leucoscepus muhamed-ben-abdulla, Erl. South Somali Yellow-throated Francolin.
Ref. Erlanger, Monatsb. xii, p. 97, 1904
Type locality, El Wak-Bardera.

Distribution in Kenya: Jubaland, west to the Lorian, and N.E. of the N. Guasso Nyiro and Marsabit.

Description:

Somewhat like *P. l. infuscatus*, but with the whitish markings of the upper side including the wing-coverts, and those of the under-surface, much wider; the flank feathers having a wide white shaft-streak.

Immature birds are very much paler than young *infuscatus* of the same age.

Habits:

As for other races.

We now come to consider the birds inhabiting the northern parts of Uganda through Karamoja, South Rudolf, eastwards to Loroki and Ndoto.

Through the kindness of Capt. Stoneham I have been able to examine specimens from Kakamari. In my opinion these birds are quite distinct from typical *infuscatus* from Lake Jipe. They are

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** *I would here take the opportunity of asking members to assist the Museum in securing examples of these birds and other "Game Birds" so that the collection of topotypical examples may be completed.*

very much darker, more blackish, and the whitish-cream marking of the underside are much more distinct as a result of contrast and the angular white ends are much wider especially on the flanks. There is furthermore very little chestnut along the shafts of the flank feathers. The uppersurface from the crown to the rump is very much darker and less brownish; here again also, though the white shaft-streaks are comparatively narrow yet they are rendered conspicuous by virtue of contrast with the rest of the feather.

As we go further east and south to N. Laikipia, Ndoto, etc., we get the same dark bird but with more chestnut along the shafts of the feathers on the lower-breast and flanks, and different from the Kakamari birds in having the white shaft-streak of these flank feathers hardly expanded at the tips. Birds of this description intergrade with the Lorian race in the thorn-bush country north of the N. Guasso Nyiro, and with *infuscatus-keniensis* intergrades in the Laikipia area. In the case of a species with a very wide distribution covering areas with marked change of altitude and consequent variation in climate and vegetation, it is not surprising to find no clear line defining the various races.

THE BUTTERFLIES OF KENYA AND UGANDA.

Part II.

Sub-Family.—ACRÆINÆ.

The Genus.—ACRÆA.

This genus has been monographed by Dr. H. Eltringham, and we are indebted to this monograph for a great deal of information, in particular the Key to the species is merely Dr. Eltringham's key, simplified and adapted for those species which occur in Kenya and Uganda.

We do not consider it necessary to describe the genus at length, as it is not difficult to recognise the genus from any other except *Planema*.

The fore-wings are generally rather long, and are always rounded, except that the fore-wing is sometimes produced, and the hind-margin slightly concave. In the fore-wing the sub-costal nervure is five-branched, the first branch being given off before the end of the cell. *Planema* may be known by the palpi, which are black with a lateral grey line; by the position of the first branch of the fore-wing sub-costal, which is given off at or beyond the end of the cell, (this distinction failed in some specimens of *P. quadricolor itumbana*); and by the relatively much smaller discoidal cell in the hind-wing.

The various species of *Acræa* are extremely difficult to discriminate, and the key is by no means infallible, especially for the females, but we believe that it will be of great assistance in identifying the great majority of captures. The fact is that variation is so great in some of the species, and many run so close together, and moreover have a most annoying way of resembling each other in the same geographical area, that the construction of a key which would cover every possible variety is almost impossible. As is frequently the case with distasteful genera, individual variability is combined with a strongly-marked general resemblance, and moreover there can be little doubt that some species are direct mimics of other species in the same genus or in the closely-allied genus *Planema*.

Acræas usually fly slowly and float about a good deal, they are often very abundant, and though many species inhabit forests, yet, on the whole they are more characteristic of the open country.

All the species of this genus are very resistant to cyanide, even the smallest species taking at least half an hour to die in the poison bottle, and it is almost impossible to kill them by pressure on the thorax without mutilating them.

KEY TO SECTIONS.

H.-w.	without black spots	I.
H.-w.	with black spots	(a)
(a)	H.-W. underside with dark internervular rays at least in some of the spaces, such rays not being bifurcated at or near the margin ...	(h)
	H.-w. underside without such internervular rays, or with such rays bifurcated	(b)
(b)	F.-w. upperside fully scaled and not transparent*	(d)
	F.-w. partially transparent usually on outer half	(c)
(c)	H.-w. hindmargin at least partially transparent, without spots or black border	II.
	H.w. with spots or black border ...	III.
(d)	H.-w. hindmarginal border on the underside enclosed by a black line without enclosed spots	IV.
	H.-w. marginal border on underside with such enclosed spots ...	(e)
(e)	The black or dark colour enclosing spots is not produced inwards, the spots being submarginal, or if marginal the h.w. also bears discal spots	(f)
	Otherwise	VIII.
(f)	Basal spots of h.-w. underside are more or less confluent and enclose or tend to enclose pale spots ...	V.
	Basal spots not confluent ...	(g)
(g)	Discal spot in 1b of f.-w. is much nearer margin that that in 2 ...	VI.
	Discal spot in 1b is beneath or nearly beneath that in 2	VII.
(h)	Internervular rays not connected with hind margin or at least reduced to a fine point at margin ...	IX.
	Internervular rays connected with margin	X.

* *Aglaonice*, *amicitiæ* and *doubledayi* sometimes have a partially transparent apical patch; *pudorella* and *equatorialis* are sometimes so thingly scaled as to be partially transparent.

I.	H.-w. with a black discal band ...	*zonata*.
	H.-w. without such band	rabbaiæ mambasæ.
II.	F.-w. without spots...	(b)
	F.-w. with spots	(a)
(a)	H.w. nervules 6 and 7 stalked ...	cerasa.
	H.w. nervules 6 and 7 not stalked ...	iturina iturina.
(b)	H.w. generally with only one spot ...	(c)
	H.w. with more than one spot ...	(d)
(c)	Wings almost entirely transparent	orestia humilis (part).
	Basal part of f.w. and almost all h.w brick-red	unimaculata.
(d)	H.w. without a spot in the middle of the cell	damii cuva.
	H.w. with such spot	quirina.
III.	Abdomen long, extending well beyond wings	bræsia.
	Abdomen not so	(a)
(a)	Base of forewing transparent, not scaled with yellow, red, or black ...	cinerea.
	Base of F.-w. scaled	(b)
(b)	F.w. with a blackish transverse bar from costa to inner margin ...	(c)
	F.w. without such bar	(d)
(c)	H.w. with an irregular transverse bar	satis.
	H.w. without such bar	cerita.
(d)	H.w. basal spots more or less confluent	(e)
	H.w. basal spots well separated ...	admatha.
(e)	F.w. with discal spots in areas 4, 5 and 6	neobule.
	(The female *chilo* has all the wings transparent)	
	F.w. without such spots ...	insignis.
IV.	Discal spots of h.w. form a regular line which traverses areas 7, 6 and 5 parallel to the apical margin and then bends inwards at less than a right angle to inner margin ...	rahira.
	H.w. discal spots not so arranged...	(a)
(a)	Area 7 of h.w. with 3 black spots ...	rohlfsi.
	Area 7 of h.w. with less than 3 spots	(b)

(b) F.w. ground colour black or olive-brown ... ... asboloplintha.
F.w. ground colour not so ... ... amicitiæ.

V. F.w. brown-black above without red or yellow marks ... ... zetes zetes.
F.w. not so ... ... (a)

(a) Base of f.w. beneath with unbroken black patch ... ... anemosa.
Base of f.w. beneath with separated black spots ... ... (b')

(b') Ground colour of f.w. black-brown with reddish or yellowish sub-marginal spots ... ... zetes menippe.
Ground colour of f.w. not black-brown ... ... (c)

(c) F.w. hind margin, at least in areas 1b and 2, without marginal spots of the ground colour or of yellow enclosed by black ... ... pseudolycia.
F.w. hind margin with such spots... (d)

(d) Sub-apical area of f.w. not separated nor of a different shade from ground colour ... ... chilo.
(For female see IIIe).
Sub-apical area separated and containing a patch which is either rather paler or bright orange ... (e)

V. (e) F.w. with small sub-apical patch of red or reddish-white ... ... zetes jalema.
F.w. with a large orange sub-apical patch ... ... zetes acara.

VI. F.w. apex on underside with well-marked black inter-rays which reach margin ... ... (a)
F.w. apex on underside without such rays ... ... (c)

(a) Hind wing with three spots in area 7 ... ... cepheus.
H.w. with two spots in area 7 ... (b)

(b) H.w. marginal border with green spots ... ... (part) egina egina.
H.w. marginal border with orange spots ... ... (part) perenna perenna.

(c)	F.w. with sub-marginal spots in at least 1b and 2	(d)
	F.w. without such spots	(e)
(d)	Fore wing nervules at apex well marked with black	petræa.
	F.w. with nervules at apex not specially black	omrora.
(e)	F.w. black rather thing scaled in the middle, and a scarlet inner marginal patch in 1a, 1b and 2, no sub-apical red patch	(f)
	F.w. not so marked	(g)
(f)	F.w. at apex without red streaks...	egina egina.
	F.w. at apex with red streaks ...	egina harrisoni.
(g)	H.w. on underside encloses square spots the inner edge of which is neither rounded or pointed ...	egina areca.
	H.w. on underside margin encloses spots which are rounded or pointed on inner edge	(h)
(h)	On hind wing underside the discal spots form a regular row from costa to area 4, and then bends sharply inwards at an angle of less than 45°	(i)
	Spots of h.w. underside not forming such a pattern	acrita.
(i)	F.w. with white sub-apical patch...	wigginsi.
	F.w. without such white sub-apical patch	anacreon.
VII.	F.w. with hind-marginal spots in at least 1b and 2	(a)
	F.w. without such spots	(c)
(a)	F.w. with distinct black internervular rays towards apex ...	oncæa.
	F.w. without such rays	(b)
(b)	F.w. discal spots close to end of cell	natalica.
	F.w. discal spots widely separated from end of cell	cæcilia.
(c)	F.w. with black internervular streaks in apical area	(d)
	F.w. without such streaks... ...	(e)

(d) Inner edge of h.w. marginal border sinuous ... ... doubledayi.
Inner edge of h.w. marginal border not sinuous ... ... equatorialis.

(e) Wings opaque; spot in area 2 of h.w. not at base of that area ... caldarena.
Wings translucent; spot in area 2 of h.w. at base of that area ... ... pudorella.

VIII. H.w. on underside with a sharply-defined inner marginal and pale triangular marginal spots, no striation (a)
H.w. margin on underside not plain black, with only marginal spots; striated, or the dark colour produced inwardly as red or black internervular marks in at least areas 2 and 3 ... ... (b)

(a) Basal black of f.w. forms a patch, the outer edge of which is more or less continuous with that of the h.w. basal black, and is not deeply indented on the median by the reddish ground colour ... ... uvui.
Basal black of f.w. deeply indented by ground colour ... ... bonasia alicia.

(b) H.w. on underside bears on costa a crimson triangle enclosed by a black line ... ... excelsior.
H.w. underside not so marked ... (c)

(c) H.w. border beneath bears long internervular rays which are bifurcated at margin and enclose pale spots, such spots being mostly wider before than at margin ... althoffi.
If h.w. border bears long bifurcated rays the pale spots they enclose are triangular and widest at the margin ... ... (d)

(d) F.w. has little or no basal black, female very variable ... ... terpsichore.
F.w. with basal black ... ... (e)

(e) F.w. basal black with outer edges regular and not deeply indented at median nervule ... ... (f)
F.w. basal black deeply indented on median nervule, or at least median nervule not blackened ... (g)

(f) Pale patches very large, outline of f.w. basal black not forming an angle with that of h.w. ... ... viviana.
Pale patches small, outline of f.w. basal black makes an angle with that of h.w. ... ... esebria karschi.

(g) H.w. upperside with little or no black at base, or if with an appreciable amount of black, then also having a deep orange triangular marginal spot in each internervular space ... ... acerata.
H.w. upperside with a triangular basal black patch ... ... (h)

(h) F.w. basal black after extending some distance along nervure 1 does not bend upwards towards the cell ... ... cabira.
F.w. basal black does bend upwards towards the cell ... ... (i)

(i) F.w. basal black after extending along nervure 1 ends in an upwardly directed point ... ... bonasia bonasia.
F.w. basal black has a blunt or bifurcated termination ... ... sotikensis.

IX. F.w. with a large well-defined spot in cell ... ... (a)
F.w. without such spot in cell ... (b)

(a) Fore-wing cell spot and at that at base of area 2 fully scaled with lemon yellow ... ... melanoxantha.
F.w., these spots transparent or very sparsely scaled with whitish ... mairessi.

(b) F.w. with cell and most of areas 2 and 1b fully scaled with red ... aubyni
F.w. basal red, if any, much broken up and obsolescent ... ... (c)

(c)	Black margin of h.w. very narrow (not more than 2mm.)	peneleos (part).
	Black margin of h.w. more than 2mm. wide usually 4mm.	penelope.
X.	F-w. bears sup-apical spots; no sub-marginal spots	(a)
	F-w. not bearing sub-apical spots ...	(g)
a	H-w. discal spots in 4 nearer to cell than in 3 or 5	(b)
	H-w. discal spots not nearer ...	(c)
b	H-w. underside with a black border bearing orange spots	perenna.
	H-w. margin without orange spots	pharsalus.
c	F-w. with white sub-apical band ...	(d)
	F-w. without a white sub-apical band	(f)
d	F-w. ground colour white	encedon f. lycia.
	F-w. ground colour tawny... ...	(e)
e	H-w. with white patch	encedon f. alcippona.
	H-w. without white patch	encedon f. encedon.
f	Nervules ending broad black triangles at margin; h-w. with white patch	encedon f. radiata.
	Nervules not so ending, no white patch	encedon f. daira.
g	F-w. may be brown or black with sub-apical pale patch	(h)
	F-w. not so	(L)
h	F-w. with broad confluent angulated band	alciope.
	F-w. with sub-apical pale marks separated	(i)
h	F-w. with broad confluent band ...	(I)
	F-w. with subapical and inner marginal pale marks separated ...	(2)
(1)	F-w. band orange, H-w band white	alciope f. f. aurivilii.
	Both bands orange	alciope f. tella.
(2)	F-w sup-apical pale marks include a spot near margin in 4, well separated from a series three spots near costa	(3)
	F-w. sub-apical spots only separated by the nervules and so forming a patch	(i)

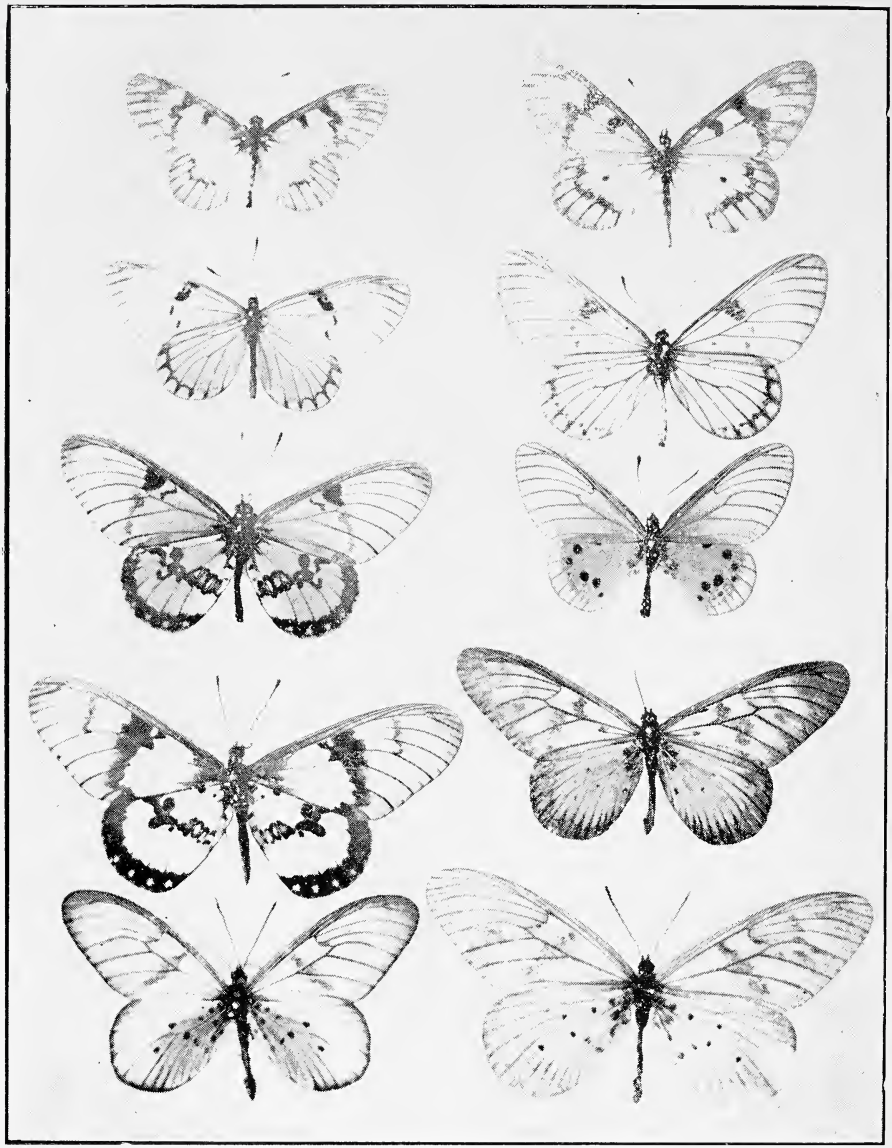

Photo: V. G. L. van Someren.

PL. I.

Upper surfaces.

Fig. 1. Acræa zonata. (Male).
Fig. 2. Acræa zonata. (Female).
Fig. 3. Acræa rabbaiæ mombasæ. (Male).
Fig. 4. Acræa rabbaiæ mombasæ. (Female).
Fig. 5. Acræa satis. (Male).
Fig. 6. Acræa satis. (Female).
Fig. 7. Acræa damii cuva. (Male).
Fig. 8. Acræa vesperalis. (Male).
Fig. 9. Acræa pentapolis. (Male).
Fig. 10. Acræ pentapolis. (Female).

(3)	H-w. with a broad dark border ...	conjuncta.
	H-w. without a broad dark border...	ansorgei.
i	F-w. sub-apical pale marks include a spot near margin in 4 well separated from a series of three near costa	conjuncta.
	F-w. sub-apical spots only separated by nervules and so forming a patch	(j)
j	Expanse not over 48-50 mm. dark transverse band from costa to hind margin in F-w. which cuts off the sub-apical patch reduced towards margin to so fine a point that the sub-apical patch is only just separated from the inner margin ...	disjuncta.
	F-w. sub-apical patch is separated from inner margin by a dark transverse band of considerable width. Expanse over 50 mm. ...	(k)
k	H.w. dark border fairly sharply defined inwardly, or in the forms in which it is not so, then f-w sub-apical patch very narrow rarely more than 3.5 mm. H-w. border never so broad as to reach end of cell	esebria.
	H-w border if present not defined inwardly except in form in which it is so broad as to touch the cell; in such f-w. sub-apical patch is more than 3.5 mm. wide	jodutta.
l	F-w perfectly transparent, scaleless; except for a narrow intensely black apical pand hind marginal border	semivitrea.
	F-w. not as above	(m)
m	H-w cell beneath with not more than one spot	(n)
	H-w. cell with more than one ...	(q)
n	F-w with a sub-apical patch of three elongate transparent spots ...	servona.
	F-w. without such patch	(o)

o	H-w beneath with a narrow central elongate yellow patch, and an inner marginal red-brown patch	oreas.
	H-w. beneath not so marked ...	(p)
p	Distal outline of H-w. pale patch has a tendency to angle at 4° giving the patch a quadrate appearance ...	johnstoni.
	Distal outline hind patch rounded...	lycoa.
q	Both wings fully scaled	(r)
	Transparent or part of both wings so	(t)
r	F-w. without red or orange ...	lycoa.
	F-w. with red or orange	(s)
s	F-w. with elongate spots between nervures	1
(1)	H-w. discal spot large and forming a band extending beyond cell ...	orina.
	H-w. discal spot not extending beyond cell	2
(2)	H-w. spots confluent in large basal patch	orina orineta.
	H-w. spots though obscured, are not confluent	parhassia.
t	F-w. not thickly scaled	1
(1)	On the underside the base and margin of h-w. dark brown enclosing between them a narrow ochreous band	peneleos pelasgius.
	Beneath not so marked	c'
t	The transparent areas are confined to small well-defined spots sub-apical	a'
	Transparent spots not so confined bu considerably elongate	d'
a'	F-w. ground colour red-brown ...	amicitiæ.
	F-w. ground colour brown-black ...	b'
b'	H-w. with red band	peneleos pelasgius.
	H-w. without red band	c'
c'	Large forms with wings 65-90 mm. F-w. mostly transparent with irregular dark bands	d
	Expanse much less pattern, not as above	f'
d'	H-w. fully scaled	vesperalis.
	H-w. part transparent	e'

e'	F-w. dark bars. H-w. basal scales heavy	pentapolis epecida.
	H-w. scales lightly developed ...	pentapolis pentapolis.
f'	H-w. with well defined transparent or semi-transparent marginal border	g'
	H-w. margin at least as fully scaled as rest of wing	h'
g'	H-w. border broad, tarsal claws equal	quirinalis.
	H-w. border narrow, blackish dusting most at angle	orestia.
h'	H-w. with distinct yellow patch spots in f.w. transparent	servona.
	H-w. with ill-defined yellowish patch; spots in f.w. not transparent	lycoa.

1. *ACRÆA ZONATA*, Hew. Pl. I., figs. 1 & 2. Pl. IV., fig. 1.

Length of F.-w. 25-32 mm. General colour orange-brown with nervules marked in darker brown. F.w. Costa dark. A black transverse bar is present at about the middle of the cell. A black band commences at the costa in a line with the apex of the cell and proceeds downwards in irregular fashion to the hind angle. A less well defined sub-apical band, decreasing in width as it proceeds downwards in a concave formation, extends from the costa to the hind-margin and joins the first band at vein 2.

The margin of the wing is dusted with blackish especially so in the region of the veins.

The H.-w. has a blackish base and margin and an irregular discal band extending from the costa to the anal angle. A black spot is sometimes present in the course of vein 5.

Undersurface marked as above but less indistinctly and is somewhat glazed.

The female is very similar to the male but is generally larger and paler especially in the hindwing, and the markings are more diffuse.

Early Stages:

Nothing is known regarding the egg and larva of this species.

This rather a rare insect and has a restricted range. We have taken it in forest, usually flying high. It has an annoying habit of sailing round a tree top well out of reach. When in flight it is confusingly like the next species.

DISTRIBUTION.

The range would appear to be from Witu to Vanga and inland to Taita, but it is nowhere plentiful.

2. *ACRÆA RABBAIÆ MOMBASÆ*, Gr. Smith. Pl. I., figs. 3 & 4. Pl. IV., fig. 2.

Expanse 55-65 mm. General colour dull, pale brownish. F.w. semi-transparent, all the veins distinctly marked blackish-brown. A dark transverse band commences at the costa and crosses the apex of the cell and continues in diminished width and somewhat interruptedly towards the hind angle at vein 2. The apex and margin are somewhat dusted over with blackish scales relieved in the internervular spaces by pale brownish spots. A distinct black spot is sometimes present in area Ib.

H.-w. cream to creamy-brown. The margin is decorated with a series of ochreous spots outlined with black, more particularly inwardly. The underside is marked as above but the surface is hyaline. The sexes are very similar, but the females are larger and paler.

When newly emerged the insect is more opaque than when old and is more creamy on both fore and hind-wings.

There is a certain variation in size and colour. In many specimens the discoidal bar is broken up into two distinct parallel lines, or occasionally reduced to a single narrow line. A further variation consists of a double spot in Ib. Not infrequently the hind marginal spots lack entirely the black edging.

EARLY STAGES:

The eggs of this species are long, barel-shaped, slightly more tapering at the upper end. There is a slight trace of longitudinal and transverse ribs. They are laid in clusters or groups on the underside of the leaves of two species of creepers (as yet unidentified). Newly laid eggs are creamy but they rapidly turn greyish-brown. When the larvæ are in the first stages they are greyish-brown, becoming in the third and last instar reddish-brown on all the segments except the first three and last. These are dull yelowish. The spines are long and branched. Fore legs yellowish, hind black. Uderside of body dull whitish. Head glossy black.

The pupa is elongate, thicker in the region of the wing cases and tapering at the tail end. The colour is variable but is generally whitish or cream, inclining to buff on the wing cases.

The thorax is angled posteriorily and laterally, a black line arises from the apex of each projection and is carried inward and forward to meet in a common line on the dorsum. The wing cases are finely lined in black. The abdominal segments are decorated with two dorsal, one lateral and one ventral, rows of black contiguous spots, one to each segment, each bearing a large orange spot in the centre.

Distribution.

The species is plentiful in the forests along the Coast from the Tana to Shimoni; occurs in Taita.

3. *ACRÆ SATIS*, Ward. Pl. I., figs. 5 & 6. Pl. IV., figs. 4 & 5.

Length of F.-w. 35-42 mm. Basal half of forewing red, apical half transparent except for the basal ends of cellules 4, 5 and 6 which are red. A triangular black spot is present at the apex of the cell which continues as an irregular band of less pigmented scales to the hind angle. This band separates the red basal half of the wing from the apical transparent portion. A wavy line crosses the outer end of the cell. An indistinct line outlines the distal edge of the red in cellules 4, 5, and 6. The apex and margin of the wing are dusted with blackish scales. Base of wing black.

H.-w. Red inclining to orange or yellowish along the inner margin. Base black. Margin broadly black with internervular red spots, variable in number. An irregular discal band, sometimes uniform, more often enclosing some red, extends from the costa to the mid-inner margin. A black spot is usually present at the base of the cell; it is occasionally duplicated.

A further spot is often present in 7.

Underside: Very like upper but marginal spots in hindwing larger and paler and more conspicuous. H.-w. ochreous red with black marks as above.

Female:

Larger than the male and similarly marked; though the red areas are here replaced by white.

A variety of female has the white of both or only the hindwing replaced by cream or buff.

Early Stages:

Unknown.

Distribution:

The Coastal forests and woodlands. Uncommon in Taita. The species is rather seasonal, but never abundant. It is not infrequently found in Cocoanut plantations on the mailand and even those of Mombasa itself. The female undoubtedly comes within the *Amauris ochlea* mimetic association.

4. *ACRÆA PENTAPOLIS*, Ward. Pl. I., figs. 9 & 10. Pl. IV., figs. 9 & 10.

= *THELESTIS*, Oberth.

Length F.-w. 40-45 mm. General colour, semi-transparent with inner part of hindwing brick to orange red.

F.-w. almost entirely transparent with indistinct dusky areas. Costa dusky; a fairly distinct bar crosses the cell at origin of vein 2 and extends down in a straight line through the base of area 2 in to Ib in the direction of the hind angle, but does not reach this point. There is occasionally a patch of dusky scaling at the base of 3, and a slight scaling sub-basally in 4, 5, and 6.

Margin lightly scaled dusky. A spot is sometimes present in basal angle Ib.

H.-w. Outer half of wing transparent, margined with blackish; inner half brick red, orange red to ochreous. Base slightly blackish or brownish. Numerous black spots present. (See underside).

FEMALE:

Marked as in the male (though markings are wider and less distinct), considerably larger and more brownish and with the patch in the hindwing cream to ocheous.

Underside: Much like above but almost entirely unscaled. H.W. patch less bright and with basal and inner margin more ochreous. The spotting is distinct though somewhat variable, the specimen figured shews the following: Base 8 one; towards base of cell, two. Bases of 1, 2, and 3 one each; sub-basally in Ic and 3, one each. Two at about mid-point in Ia.

EARLY STAGES:

The eggs are a long oval, slightly more pointed and flattened at the upper end. Faint indications of ribbing and transverse ridges. Larva brownish in first instar, turning reddish-brown after the second moult. Underside of body yellowish. A white body line extends from the fourth to the twelfth segment. Head redder than body, with a white inverted V above the mouth parts. Fore and hind legs yellowish. Spines branched and long.

Pupa long, 25 mm., whitish, decorated with nervular black lines on the wing cases, heavy marks on the dorsum of the thorax, raised orange spots on the dorsal and lateral aspects of each abdominal segment, each spot encircled with black.

DISTRIBUTION:

Western Uganda east to Mabira and occasionally reaching Jinja.

This is a somewhat scarce species and has seldom been taken by us. The females are somewhat like *Planema albicolor* when in flight and may possibly belong to this mimetic group.

5. *ACRÆA VESPERALIS*, Gr. Smth. Pl. I., fig. 8; Pl. IX., fig. 5.

Length F.-w. 38-40 mm. General colour greyish transparent and brown. F.w. transparent with dusky areas and lines. A more or less well-defined irregular spot is present at the sub-apical portion

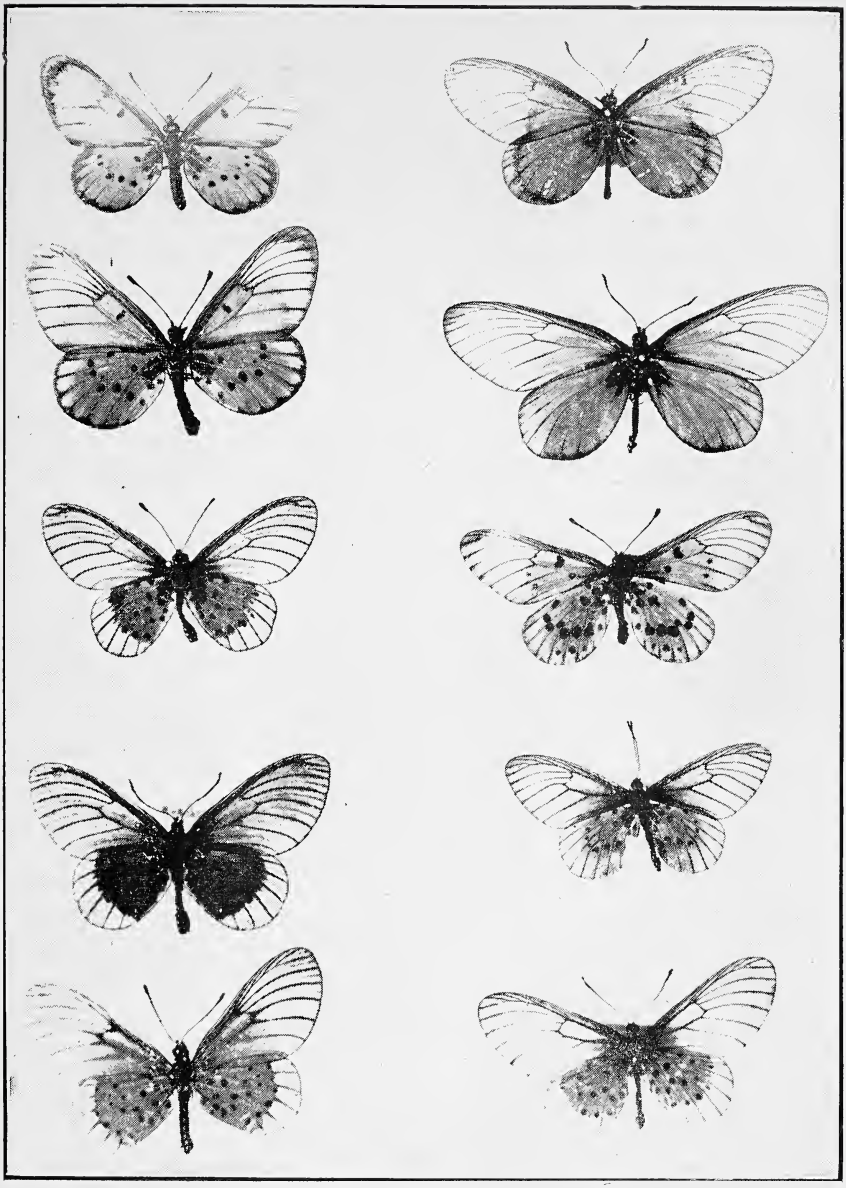

Photo: V. G. L. van Someren.

PL. II.

Upper surfaces.

Fig. 1. Acræa cerasa. (Male).
Fig. 2. Acræa cerasa. (Female).
Fig. 3. Acræa quirina quirina. (Male).
Fig. 4. Acræa quirina rosa. (Male).
Fig. 5. Acræa quirina rosa. (Female).
Fig. 6. Acræa unimaculata. (Male).
Fig. 7. Acræa unimaculata. (Female).
Fig. 8. Acræa cerasa, var.
Fig. 9. Acræa orestia, f. transita.
Fig. 10. Acræa quirina quirina. (Female).

of the cell. An oblique band of ill-defined spots in discocellulars. Apex of wing broadly dusky, which colour extends down the outer margin. A large spot fills the base of area 2, and immediately below this in area Ib is another spot. A small black spot is situated subbasally in 1b and this is connected to the base of the wing by a narrow black line.

H.-w. Orange-brown, with a broad marginal border of dusky brown; this colour extends well up the veins and to a slightly lesser degree as internervular rays. The basal spots are indistinct: two small spots at the extreme base, two larger ones at base of cell. Two large spots in Ic, one large one in 2, one in 3 and two in 4. These spots are however variable in size and number.

Underside: F.-w. basal two-thirds brownish, apex and margin orange orchrous, with internervular rays defined. H.W. orange patch ill-defined owing to sparsity of scaling; nervular and internervular rays distinct but no definite marginal border.

EARLY STAGES:

Unknown to us.

DISTRIBUTION:

Western Uganda east to the Sesse Islands.

This is a somewhat scarce species in Uganda, in our experience, and little is known of its habits.

6. *ACRÆA DAMII CUVA*, Gr. Smth. Pl. I., fig. 7. Pl. IV. fig. 3.

Length F.-w. 30-35mm. General colour bright red with transparent tips to the forewing.

F.-w. thinly scaled at apex and margin, almost transparent, becoming bright brick-red over the rest of the wing.

H.-w. brick-red, inclining to buff on inner margin. Outer margin transparent. A variable number of spots present. (See underside). Underside: F.w. almost scaleless, and pinkish in colour.

H.w. is sparsely covered at the costa and the discal area to the anal angle with ochreous and white scales.

The black spots are as folows: A small spot in Ib, large spots in 2 and 3, two small ones in 4 and 5, a large spot mid-way in 6, and a larger one about half way along 7. These spots are visible above and in addition to them there are the following: a small spot at the base of cell, one at the margin of costal vein, two larger at base of Ic, and two set transversely in Ia and Ib.

FEMALE:

The female is like the male but duller, or the red may be replaced by yellowish or white.

EARLY STAGES

Unknown

DISTRIBUTION:

Coastal forests from Sokoke to Shimoni.

This is a rare species which flies high and is difficult to capture unless it happens to be hanging around a food plant.

7. *ACRÆA CERASA*, Hewit. Pl. II., figs. 1, 2, & 8. Pl. V., figs. 5 & 8.

Length of F.-w. 25-32 mm. General colour orange red with terminal half of forewing semi-transparent. F.W. Basal half to apex of cell and downwards to the hind angle, brick-red. A black spot is present at about the middle of the cell and a second one at its apex. Occasionally the cell spot is absent. Costa, apex and margin with black scales, rest of wing transparent.

H.-w. Brick-red except for the marginal border which is thinly scaled with blackish, the black extending up the veins and so causing an undulating edge to the red patch.

Numerous black spots are present; one at about the centre of the cell, a row of discal spots extending from Ia to 7 at about mid-costa. A black suffusion is present at the base of the wing.

Underside: Without scales except at the apex of the wing and margin of the hind wing. The scales are ochreous. A few red and white scales are also present at the base of the hind wing.

The spotting is distinct—in addition to those mentioned as being visible above there are the following: Two at base of cell, one at base of area 7, two towards base of 9, and two in Ib.

Some males have an orange area at base of Ib in f.w.

FEMALE:

Very often like the male but larger and duller, but more often red is replaced by brownish or ochreous.

A variety of female sometimes met with has extra spots in the forewing, one at base of 2, two in Ib. In the hindwing the basal black suffusion is absent, it being replaced by distinct large spots. The large spots in Ib, 2, and 3 are placed in a straight line and under these are three to sux running parallel to the margin. (See fig. 8, Pl. II.).

EARLY STAGES:

The eggs of this species are laid in a bunch in most irregular fashion, very often one on top of another, three to four deep, on the underside of single leaf of *Rawsonia Usambarensis*. (See frontispiece).

When the female has selected a suitable leaf, she will take up her position on the undersurface and deposit ten to fifteen eggs in succession and then rest for a while, completing the deposition in the

space of an hour or so. She does not leave the leaf until the full complement has been laid. In shape these eggs are barrel-like with indications of longitudinal and transverse grooves. Their surface is highly glazed. The colour is at first creamy, rapidly becoming orange then greyish. The young larva is brownish, changing at the second moult to a parti-colour-dull brownish and black. The first four and a half segments are purply-brown, the remainder with the exception of the last two, ochre. The hind segments are coloured as the anterior. A white interrupted line runs the length of the body from the second to the anal segment, just above the level of the legs. The undersurface of the body is yellowish to olive. A mid-dorsal white line extends from the first to the tenth segment. The anterior legs are yellowish with black tips, the hind legs olive. The branched spines on the sixth to anal segments are brownish and short, those anterior to these are very long and black. When disturbed, the larva has the curious habit of arching the front segments and throwing forward the long spines into a bunch over the head. The head is jet black with an inverted white V just above the mouth parts. Fine white hairs cover the lateral lobes. The pupa is rather peculiar, being rather squat and somewhat curved. It is ochreous-brown in colour, and is decorated with fine black lines on the wing cases. Each abdominal segment is ornamented with raised yellowish spots, two dorsally, one ventrolateral The base of each spine is finely encircled in black. Both larvæ and pupæ are liable to heavy parasitisation by a species of dipteron. The newly emerged butterfly has the tips of the wings opaque greyish.

DISTRIBUTION:

The species is common round Nairobi and occurs on Mt. Kenia and extends north through Kijabe to Jinja in Uganda.

8. ACRÆA CERITA, E. M. Sharpe. (Not figured).

Expanse 46 mm. As we have no specimens of this insect, described from a unique example we quote from Eltringham's Monograph.

" F.-w. basal half brick-red, extending not quite to end of cell projecting into the basal part of area 2, and occupying about half of areas Ib and Ia. The red area is sharply defined and is enclosed outwardly by a dusting of black scales forming a tranverse bar right across the wing from costa to inner margin which it meets just before the angle. Costa and apex also dusted with blackish. Outer half of wing transparent and very iridescent, the scales reduced to fine hairs. The hind margin very slightly darker. In the cell a small black spot over origin of nervule 2.

In area Ib a small spot lying in the line between the cell spot and the hind angle. In the same area another spot midway between base and nervule 2. H.-w. brick-red with a very little blackish at base and a narrow greyish-black hind marginal border.

" A few black spots as on underside.

" Underside. Both wings almost scaleless. H.w. spots as follows: Two in 7, the second just below the origin of nervule 7. Two in cell on one wing and one on the other, the second spot just before origin of nervule 2. In areas 3, 2, 1 and 1b a row of discal spots lying almost in a horizontal line and beyond these in 3, 2, and 1 traces of submarginal dots are visible with a lens. A sub-basal spot in 1, 1a, 1b that in 1b more distally placed than the others."

EARLY STAGES:

Unknown.

DISTRIBUTION:

Toro, Uganda.

9. *ACRÆA UNIMACULATA*, Gr. Smth Pl. II., figs. 6 & 7, Pl. V., fig. 6.

Length F.w. 25-32 mm. General colour dull red with transparent fore-wings. F.W. Basal half from the end of cell to hind angle dull red.

Costa, end of wing and margin dusted with blackish scales. Base with slight blackish suffusion. In some specimens the outer edge of the red patch is distinctly outlined with denser blackish scales.

H.-w. Base blackish, margin semi-transparent, and dusted with blackish scales, these extending up the nervules for a short way and producing an indented margin to the red patch which fills the remainder of the wing.

Underside. Duller than above and devoid of scales except at extreme base. Two small black spots are present at the base of the cell, two in 1c and one or two at extreme base of wing.

FEMALE:

Like the male but duller and larger.

EARLY STAGES:

These are unknown.

DISTRIBUTION:

This species is known only from North Kavirondo, Kaimosi, Maragoli, Nandi and Kitosh. It is somewhat rare. Its flight is slow and gliding, yet never-the-less it is difficult to capture unless when feeding

10. ACRÆA ITURINA, Gr. Smth. (Not figured).

Expanse 50 mm. The description of this species is taken from Eltringham's Monograph, as we have no specimens by us.

"F.-w. rather transparent clouded with smoky-brown along costa and hind margin. This clouding varies in intensity in different examples. Transparency caused by narrowing of scales. The basal area having a brownish-red suffusion—extending nearly to end of cell and two-thirds of length of inner margin. A large black spot somewhat beyond the middle, and varying considerably in intensity. A small black linear spot at base of area 1b.

H.w. red with semi-transparent smoky margin considerably wider at apex. Base black. Two black spots in area 7 rather close together. A discal row of seven spots, the first four usually smaller than the rest and the fourth nearer the margin. Two spots in the cell, that nearer the base often very small. One basal spot in 1a, 1b 1, the second of these sometimes confluent with the last discal spot.

Nervures 6 and 7 arise from a common stalk. Underside vitreous and without coloured scales, the h.w. spots repeated.'

FEMALE:

Resembles the male but is more transparent.

EARLY STAGES:

Unknown.

DISTRIBUTION:

Uganda, Lake Albert and the Sesse Islands. This is a rare species and has seldom been taken.

11. ACRÆA QUIRINA QUIRINA, Fabr. Pl. II., figs. 3 & 10. Pl. V., figs. 4 & 7.

Length of F.-w. 25-30 mm. General colour, rosy-red with a large part of fore and hind wings transparent.

F.w. mostly transparent, with a slight black area at base, a black line at base of 1b, and a trace of rosy suffusion at the base of 1 and 1b.

H.w. rosy red inclining to blackish at the base and with a well-defined wide transparent marginal border. Several spots are present, all confined to the red area, as follows: Along the outer margin of the red a series of seven, those in 1c and 2 and 3 being the largest; a second series of discal spots from 2-7; two spots in the cell towards the base; others hidden by basal suffusion.

Undersurface. Much like above but not so bright. Spotting distinct. A white basal area is present in the hindwing and to a lesser degree in the forewing.

FEMALE:

Like the male but duller and larger or more often the red is replaced by brownish ochreous.

EARLY STAGES:

The eggs are laid in groups (not necessarily all on one leaf) on the underside of the leaves of a plant unidentified.

They are white to cream, long oval with the upper end more tapering and slightly flattened on top. The mature larva is blackish-brown with a central dorsal white stripe and a white spiracular line. Spines moderately long and black in colour. Pupa black marked on a white ground.

DISTRIBUTION:

Uganda east to Nandi.

21. ACRÆA QUIRINA ROSA, Eltr. Pl. II., figs. 4 & 5. Pl. V., figs. 9 & 10.

Length of F.-w. 25-35 mm. General colour as typical but brighter throughout.

Very similar to the foregoing but constantly differs by having the basal half of the forewing bright rosy red and in having the hind-wing patch much more brilliant and of a deeper shade. There is furthermore a greater extent of white scaling on the underside of the fore and hind-wings. In a few specimens there is also a patch of white at the base of the inner margin of the hind-wing.

EARLY STAGES:

The eggs and the young larvæ are indistinguishable from those of the type race. In the third and fourth instars the larva is as follows: A dorso-central white line starts at the second segment, nd extends the whole length of the body. On either side of this is a purply brown interrupted line, made up of a series of 4 dots to each segment. A branched spine arises from the second dot of each segment. This line is followed by a wider cream coloured line starting at the third segment and extending to the anal end. Below this is a wider blackish line, with a light streak in the centre of each segment. A white spiracular line separates the lateral ones from the greenish or brownish underside of the body. Each spine is situated on a slighlty raised blue-black base. The feet are greyish and the head is entirely black.

The pupa is elongate, whitish to creamy-brown in ground colour, and ornamented with black lines and spots. The head is provided with two lateral short spines black above, white below.

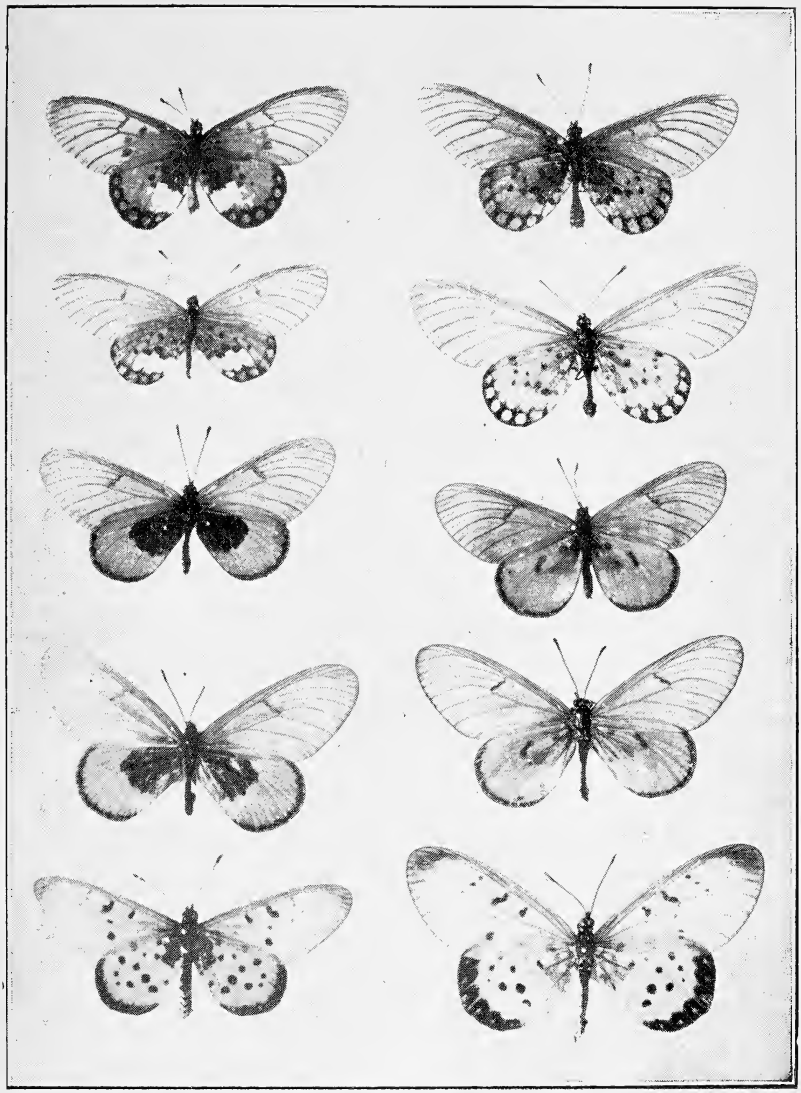

Photo: V. G. L. VAN SOMEREN.

PL. III.

Upper surfaces.

Fig. 1. Acræa admatha leucographa. (Male).
Fig. 2 Acræa admatha leucographa. (Female).
Fig. 5 Acræa insignis siginna. (Male).
Fig. 6 Acræa insignis siginna. (Female).
Fig. 9. Acræa neobule neobule. (Male).
Fig. 3. Acræa admatha admatha. (Male).
Fig. 4 Acræa admatha admatha. (Female).
Fig. 7. Acræa insignis insignis. (Male).
Fig. 8. Acræa insignis insignis. (Female).
Fig. 10. Acræa neobule neobule. (Female).

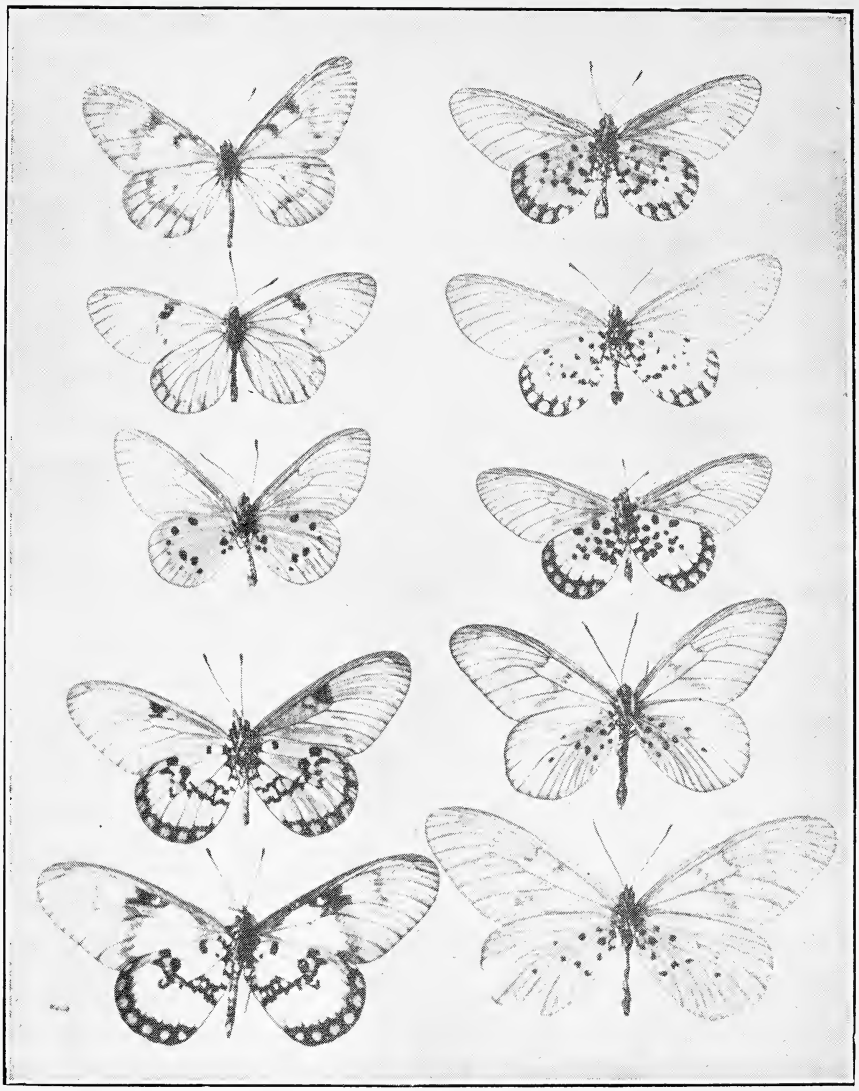

Photo: V. G. L. van Someren.

PL. IV.

Under surfaces.

Fig. 1. Acræa zonata. (Male).
Fig. 2. Acræ rabbaiæ mombasæ. (Male).
Fig. 3. Acræa damii cuva. (Male).
Fig. 4. Acræa satis. (Male).
Fig. 5. Acræa satis. (Female).
Fig. 6. Acræa admatha admatha. (Male).
Fig. 7. Acræa admatha admatha. (Female).
Fig. 8. Acræa admatha leucographa. (Male).
Fig 9. Acræa pentapolis. (Male).
Fig. 10. Acræ pentapolis. (Female).

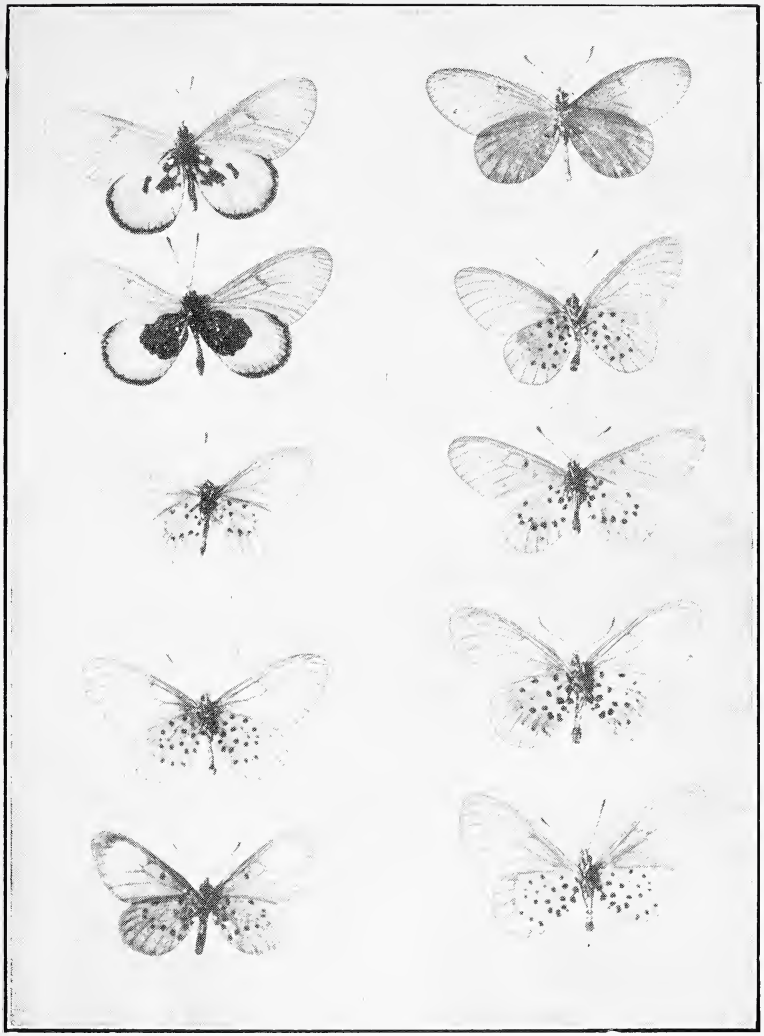

Photo: V. G. L. VAN SOMEREN.

PL. V.

Under surfaces.

Fig. 1. Acræ insignis insignis.
Fig. 2. Acræa insignis siginna.
Fig. 3. Acræa orestia f. transita.
Fig. 4 Acræ quirina quirina.
Fig. 5. Acræa cerasa.
Fig. 6. Acræa unimaculata.
Fig. 7. Acræa quirina quirina.
Fig. 8. Acræa cerasa, var.
Fig. 9. Acræa quirina rosa. (Male).
Fig. 10. Acræa quirina rosa. (Female).

The abdominal lines are made up of a series of yellow spots broadly outlined in black. The dorsum of the thorax is decorated with three contiguous crescentic marks, concavity towards the mid-line.

So far as our observations go, the larvæ will only feed on one species of food plant.

DISTRIBUTION:

This race extends from the coast to Nairobi and north to Mt. Kenia, Meru and Marsabit. It is a forest species which seldom appears in the open, frequenting the more secluded glades in the forest. It is not common at the coast and is local in its distribution round Nairobi. It is however one of the commonest butterflies at Marsabit appearing literally in thousands in such clouds as to be a nuisance.

The Marsabit specimens are by far the most richly coloured of any examples of this race.

13. ACRÆA NEOBULE, Doubl. Pl. III., figs. 9 & 10; **Pl. IX.**, figs. 3 & 4.

Length of F.-w. 30-35. General colour pinkish-red with slight transparency in forewings.

F.w. Basal half pinkish-red to just beyond the cell and distal side of hind angle. The rest of the wing semi-transparent, except at the extreme sub-apex where there is a patch of pinkish scales. The costa, apex and to a slight degree along the margin dusted with blackish. Black spots are usually distinct and placed as follows: One just beyond the middle of cell, another larger one at and transverse to the apex. Three spots in an oblique line beyond the cell in areas 4, 5, and 6; one each at base of 2 and 3; two in 1b, a small basal and a larger discal. At the base of this area is a black line.

H.w. Bright reddish-pink, with a blackish base and black marginal border carrying small red internervular spots. Numerous black spots are present. (See Pl. III., fig. 9).

Underside. F.w. like above but unscaled and not so bright. H.w. more pinkish white in central area but becoming more pink on inner margin and just internal to the black marginal border. The spots on this marginal border are white. The base of the wing carries a large black patch in which are placed three to four white marks.

FEMALE:

Marked as in the male but with the pink areas generally not always replaced with dull ochreous to white or buff. Size considerably larger.

Early Stages:

The eggs are laid in groups or clusters on a creeper with a coarse fibrous leaf (un-named) usually on the underside of the leaves but often on the main stem. They are creamy at first but become orange as they mature. They are rather longer in shape than most acræine eggs and rather pointed. The newly hatched larva is blackish or brownish, changing through brown to the reddish-brown of the full fed caterpillar. A mature larva is terracotta above and white below, with a narrow white lateral line. The legs are yellowish with black ends. The spines are fairly long with short barbs. The head is ochre-yellow. The pupa is white with heavy black markings, those on the wing cases particularly so. The abdominal segments have the usual orange spot encircled in black. The thorax is dorsally marked with two inverted U's, the lower being joined up to the two black lines from the spines of the head-piece.

Distribution:

Throughout Kenya and Uganda, frequenting both forest and park-like country, and occurring also on the open plains.

14. ACRÆA ADMATHA ADMATHA, Hewit. Pl. III., figs. 3 & 4. Pl. IV., figs. 6 & 7.

Length of F.w. 30-35 mm. General colour red with thinly scaled forewing. F.w. Distal half semi-transparent and thinly scaled, basal half orange-red to deep red. Base and costa blackish. A crescentic black spot in cell and a short line in 1b just before end of red area. Occasionally two faint spots in areas 4 and 5.

H.w. rosy red with a broad black border carrying six large round red spots. Base blackish, with a trace of whitish in 1a.

Discal and basal spots black. (See underside).

Underside. F.w. without scales except at base. Paler than above. H.w. pattern as above except that the marginal spots are outwardly edged with white and the basal third of the wing is covered with white scales. The spotting is as follows: A discal row of seven spots from 7 (mid) to 1b; two small spots at end of cell; one in 9, one in 7, two at base of cell, one in 1c and two in 1b. (See photo).

Female:

Larger than male, pattern similar, but all red replaced by ochre or whitish ochreous. The ground colour of the underside of the hind-wing is whitish.

Early Stages:

Unknown.

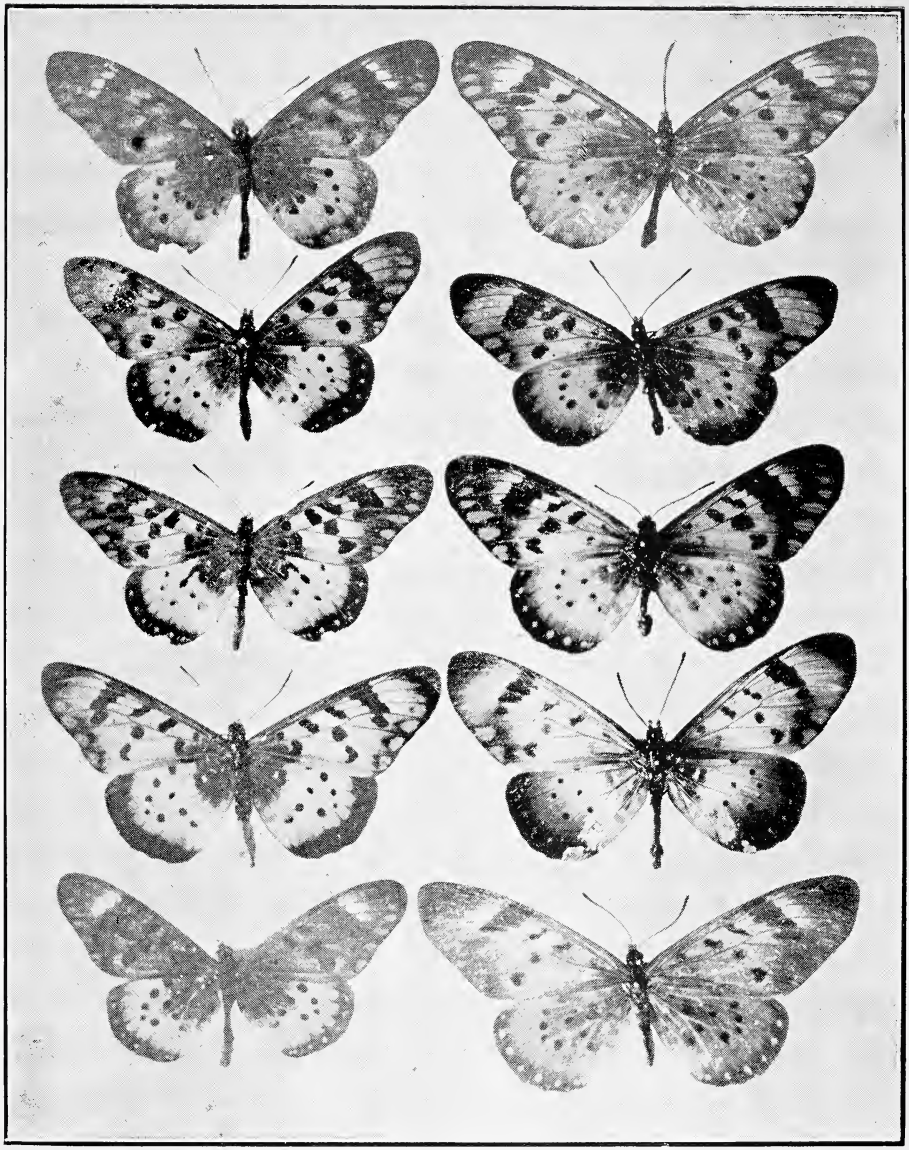

Photo: V. G. L. VAN SOMEREN.

PL. VI.

Upper surfaces.

Fig. 1. Acræa zetes f. jalema. (Male).

Fif. 2. Acræa zetes, near acara. (Male).

Fig. 3. Acræa zetes, near acara. (Male).

Fig. 4. Acræa zetes acara. (Male).

Fig. 5. Acræa zetes f. menippe. (male).

Fig. 6. Acræa zetes jalema. (Female).

Fig. 7. Acræa zetes, var. (Marsabit).

Fig. 8. Acræa zetes, var. (Marsabit).

Fig. 9. Acræa zetes acara. (Female).

Fig. 10. Acræa zetes f. menippe. (Female).

Distribution:

The species has been recorded from Witu and we have taken it in some numbers at Ngombe Crater, Matthews Range, and Marsabit. It intergrades with the next race in Uganda.

15. ACRÆA ADMATHA f. LEUCOGRAPHA, Ribbe. Pl. III., figs. 1 and 2; Pl. IV., fig. 8.

Length of F.w. 30-35 mm. This form differs from the preceding in being more brightly coloured and in having a conspicuous white patch in the hind-wing, at the anal angle, occupying 1a, 1b, 1c and 2, and to some extent 3 or even 4. As a rule the discal spots in 7, 6, and 5, and those on the hind-wing are missing, and the red marginal spots are smaller.

There are two spots in the cell, one under the costa near the base, the other just beyond the middle. There is a large spot at base of area 2, and just below this, one in 1b. This area sometimes has an additional small spot near its base and a linear mark internal to this.

Underside. The H.w. is pinkish inclining to white at the base. The white patch at the anal angle is distinct; the spots in the marginal border are red with white bordering externally.

Female:

The female is usually larger than the male, with the red areas replaced by ochreous. The white patch in the hind-wing is diffuse and extensive.

Early Stages.

Unknown.

Distribution:

Ranges from the Mau to Nandi and Elgon and west to Toro in Uganda.

It is particularly plentiful in the Kaimosi area. It frequents the forests, more particularly the edges and ravines. It has a partiality to water.

16. ACRÆA INSIGNIS, Distant. Pl. III., figs. 7 & 8; Pl. V., fig. 1.

Length of F.w. 27-35 mm. General colour brick red with the outer part of the wing blackish.

F.w. Terminal half transparent and thinly scaled; inner half brick-red, this colour extending to the cell, slightly into 3 and thence downwards to the anal angle. Extreme base of wing blackish. A black oblique band at end of cell and a linear spot at base 1b. Nervures accentuated somewhat with black scales.

H.w. Brick-red, base blackish; on margin a narrow border with wavy inner edge. A large circular spot at base of cell and a large oblique spot in discocellulars.

Underside. F.w. vitreous. H.w. creamy pink, with a brick-red line extending from the base along the inner margin and round to the outer end of the costa thus separating the pink area from the black marginal border. Base black with three to five white spots. In addition to the spots seen above there is a large irregular patch at base of 2 and sub-basally in 1c.

FEMALE:

Either like the male or dull brownish ochre. Usually larger.

A variety of male has the basal half of the forewing orange with red internervular rays, and the hindwing suffused with a pinkish bloom.

EARLY STAGES.

We have not bred this race. (See next race).

DISTRIBUTION:

Kenya, from the coast, inwards to Kilimanjaro through Ukambani to Kikuyu. This form predominates at the Coast and Kilimanjaro, but examples approaching to it appear in Uganda at Jinja and Entebbe.

17. ACRÆA INSIGNIS SIGINNA, Suffert. Pl. III., figs. 5 & 6; Pl. V., fig. 2.

Length of F.w. 27-33 mm. Differs from the typical form in having the whole of the base of the hindwing to beyond apex of the cell uniform black, or occasionally with a red area in upper part of mid-cell.

The majority of specimens shew a greater extension of the red area of the forewing. Underside as above. There are usually no white spots in the hindwing basal area.

EARLY STAGES.

Eggs creamy, long oval, slight striations on long axis and transversely. Young larva dark brownish moulting to orange brown at third instar; underside blackish. Spines long, the base of each reddish. Pupa: Golden to orange lined with black. Wing cases lined over the base. Thorax heavily marked above and entirely black below. Two dorsal black lines on abdomen composed of contiguous diamond-shaped spots, each with an orange centre. The orange on the fifth large Lateral line of spots with yellow centres. Two ventral rows of small black spots with no yellowish centres.

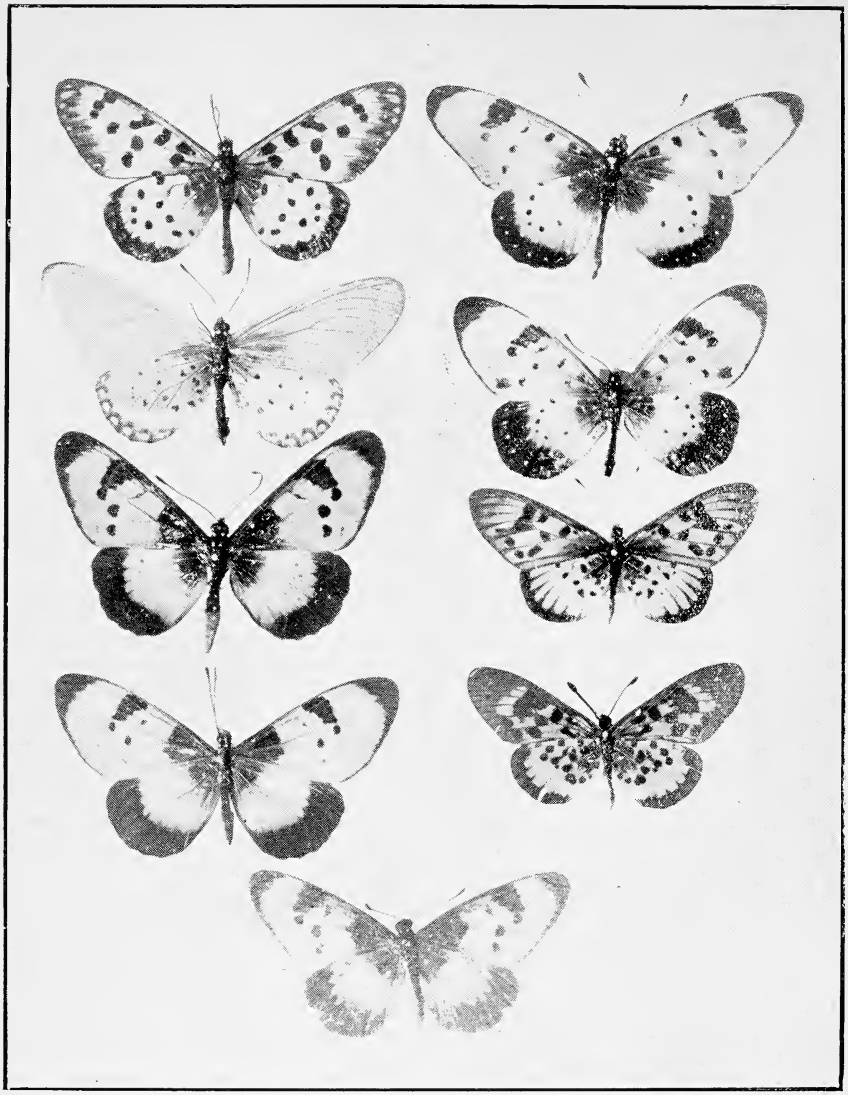

Photo: V. G. L. VAN SOMEREN.

PL. VII.

Upper surfaces.

Fig. 1. Acræa chilo. (Male).
Fig. 2. Acræa chilo. (Female).
Fig. 3. Acræa anemosa. (Male).
Fig. 4. Acræa anemosa. (Female).
Fig. 5. Acræa anemosa, var.
Fig. 6. Acræa pseudolycia f. astrigera. (Male).
Fig. 7. Acræ pseudolycia f. brunnea. (Female).
Fig. 8 Acræa petrea. (Male).
Fig. 9. Acræa cepheus. (Male).

Distribution:

This form is particularly associated with the Elgon-Nandi area, but extends to Entebbe and South Mau, and is characteristic of high altitudes generally. Both this and the previously described form have been captured in the same locality, but their respective habitats is as indicated.

The species is found in forests and the open scrub country. It has a weak flight and keeps low.

18. *ACRÆA ZETES f. MENIPPE*, Drury. Pl. VI., figs. 5 & 10; Pl. X., figs. 1 & 2.

19. *f. JALEMA*, Godart. Pl. VI., figs. 1 & 6; Pl. X., figs. 3 & 5.

Length of F.w. 35-40 mm. F.w. Ground colour brownish-black. A series of rather indistinct marginal red dots, the largest towards the hind angle. A white or yellowish transverse sub-apical band extends from the costa to nervure 4; parallel to this a series of confluent black spots at bases of areas 3-7. A spot at base of 2; one in 1b towards the margin. Base of wing blackish. Three spots in the cell, one at base, one at mid-point, one on discocellulars.

Specimens from Uganda east to Elgon usually have a slight amount of red in the cell, in 1b and 2.

H.w. vermillion red; a black marginal border carrying small white internervular spots; base of wing with strong black suffusion. Inner margin of border scalloped. Discocellular black spots clear (v. infra).

Underside. F.w. Basal half dull pinkish or ochreous, spotted as above, with in addition a small spot sub-basal on costa. Apex and margin blackish with large orange-ochre spots, the largest n 6. Sub-apical bar wider than on upper side. H.w. creamy-pink inclining to Naples-yellow on the inner margin. Margin black with semi-circular or triangular spots of creamy-pink. Inside the black border a series of seven orange spots. Base of wing dull rose-pink with a large black basal area enclosing 7-8 white or ochreous marks. Black discal spots nine in number, 7-1b set in line with contour of wing, excepting that in 2 which is more internal. There is also a spot in the upper part of cell at vein 5.

Female:

Dull brownish-grey or dull orange-brown, spotted as in the male. F.w. Black margin not well defined, and spots diffuse. Sub-apical white bar present. H.w. margin less defined and hardly enclosing large red-brown spots. Basal suffusion not very marked. Spots as in the male.

Early Stages.

Larva yellowish with red transverse bands on each segment, except the first. Spine black; bases blue-black. Anterior legs black,

posterior yellow, black tipped. Pupa yellowish or white; wing cases veined; dorsum of thorax with black diamond-shaped marks. Abdominal segments with four rows of black, each segment with a yellowish spot on the black.

A. Z. f. JELEMA. This is very like menippe, but with more red in the forewing.

DISTRIBUTION:

These forms occur in Uganda and extend to Elgon and Kaimosi, the *jalema* form predominating in the Teriki area.

20. *ACRÆA ZETES ACARA*, Hewit. Pl. VI., figs. 2 & 9. Pl. X., figs. 4 & 6.

Length of F.w. 40-45 mm. General colour light red with black marks.

F.w. Orange to light red. Spots as in other forms. Tip of wing only slightly black; sub-apical bar orange; marginal spots large and black of border reduced. Hind margin red. Basal suffusion restricted. White edges to margin 2 and 3.

H.w. Light red, with black base and marginal border. Spotting on border only slightly indicated. Black spots as in other forms. Occasionally the red in the centre of the wing is paler than elsewhere. White fringe to margin in areas 1c, 2 and 3.

Underside: F.w. dull pink. Sub-apical area whitish-pink. Apex and border with six orange spots, the upper one long, the others triangular. Black spots as above. H.w. pinkish-white with a wide black marginal border carrying well-defined bluish white spots. Black spots as in other forms. Internal to the black border there is a series of orange spots fom 1c to 7. Base of wing reddish with a large black patch bearing seven white spots.

FEMALE:

Dull brown or greyish-brown; scaling thin. Spotting as in the male but less distinct. Sub-apical bar ochreous-brown. H.w. brownish-ochre sometimes with whitish scales towards middle and along inner margin. Base suffused with brownish.

Underside: F.w. thinly scaled on basal two-thirds; sub-apical bar whitish. Internervular marks orange. H.w. white with black border carrying white spots; internal to border a series of orange spots.

EARLY STAGES.

The eggs are laid in groups on the under surface of the leaves of a creeper, not yet determined. They are a long barrel shape with longitudinal ridges and transverse grooves. Colour, yellow. Young larvæ in first stage greyish-brown, changing at third moult to the following: Head orange with black spots above the mandibles and

along the bottom edge of the lateral lobes. Segments 1 to 3 bright yellow, 4 to 9 deep purply crimson, last three bright yellow. Spines long and black, each set on a raised base shiny blue-black in colour. Fore feet yellowish, black tipped, hind feet dirty yellowish with black edges. Each segment from 3 to last with a linear yellow mark forming a lateral body line. Undersurface of body yellowish with greenish tinge.

The pupa is very elongate, yellow to orange, occasionally white; central dorsal black mark double, diverging at the head and reaching the tips of the head tubercles. Nervures on wing cases complete; abdominal marks: two dorsal, one lateral and two ventral lines composed of a series of black contiguous spots, each bearing an orange dot in the centre.

DISTRIBUTION:

Coastal forests north to the Mau, and Mt. Kenia. This race is common at the coast but gets more scarce as it extends inland. It should be noted that the larva taken in Kenya differ from that described by Trimen and mentioned by Eltringham, l.c. p. 88.

Other forms have received names:—

Acara with a white suffusion in the hindwing=*f. affra*.

That with the apex black reaching the cell=*f. mhondana*.

Specimens near *acara* from Meru are richer red than those from the Coast. The black bar in the forewing is wider and continuous with the black in the hind angle. The spots on the hindwing border are absent or just slightly indicated.

Examples from Marsabit are even richer and brighter red than the preceding and shew a transition to the Abyssinian form *sidamona*, R.. & J. It is to be noted that all the females taken at Marsabit are red like the males, never brownish-grey in true *acara*. Pl. VI., figs. 7 & 8.

21. *ACRÆA CHILO*, Godman. Pl. VII., figs. 1 & 2. Pl. IX., figs. 9 & 10.

FEMALE-CRYSTALLINA, Gr. Smith.

Length of F.w. 35-38 mm. General colour rosy-pink spotted with black. F.-w. rosy pink, apex and margin blackish carrying a more dense triangular black internervular spot at the base of each of which is an orange spot. These spots are submarginal in the apex and marginal along the border. The black spots on the body of the wing are sharply defined, and arranged as follows: Two in the cell, one transverse at about the middle, one towards the base. An oblique spot in discocellulars. Between this and the apex, four contiguous spots forming a bar; circular spots towards the bases of areas 2 and 3;

1b contains a curved spot pointing to the hind angle, and a second one at the base; a small spot mid-way along hind margin.

H.w. Rosy-pink, basal area black, margin black with white fringe and greyish internervular crescentic spots. Black spots distinct and arranged as follows:—One in 7 at about the middle; one each in 6, 5, and 4 directed slightly outwards; one each towards the bases 2 and 3. One each in 1c and 1b. A black spot at origin of 5. In cell, a long transverse spot, usually separate from the dark basal suffusing, towards the base.

Underside.. F.w. paler than above though similarly spotted, with an additional black spot before the base of the costa; a whitish-pink sub-apical area. H.w. cream-pink; margin black with 7 white spots with a greenish tinge. Base black with 5 to 6 white spots; pink patches at base of 8 and 9 and 1b and 1c, that in 1a being oblong. Spots as above with in addition, one in 9, two in base of cell, and occasionally one small one at margin of vein 5. Margin narrowly edged with white, mostly in the internervular spaces.

FEMALE:

F.w. quite transparent with a slight blackish-brown edge to apex, margin and at base of wing. Otherwise immaculate.

H.w. transparent except for brown suffusion at base. H.w. margin blackish with ochreous internervular spots. Spotting as in the male but reduced in size. Underside: F.w. as above. H.w. base rosy-pink with a few white scales on outer edge. The female form *hæneli* is intermediate in colour between the pink male and normal female.

EARLY STAGES.

Unknown.

DISTRIBUTION:

Coast of Kenia, Witu, Sokoke, Mombasa and Rabai, etc., thence inland to Voi and Taita, and penetrating as far as Nairobi. It is a straggler to the last district. At the coast it is fairly common and abundant in Taita. The female being so unlike the male was originally described as a distinct species under the name *crystallina*.

A fresh male is a beautiful rosy-pink, but it soon looses condition.

22. *ACRÆA ANEMOSA*, Hewit. Pl. VII., figs. 3, 4, &5. Pl. IX. fig. 8.

Length of F w. 35-38 mm. General colour, orange and pink with marked black border. F.w. Rich orange; Costa, margin and apex, black, with white edging to margin. Base jet black well defined and sharply cut in cell and at line of origin of vein 2. An oblique black bar of confluent spots crosses the upper part of the

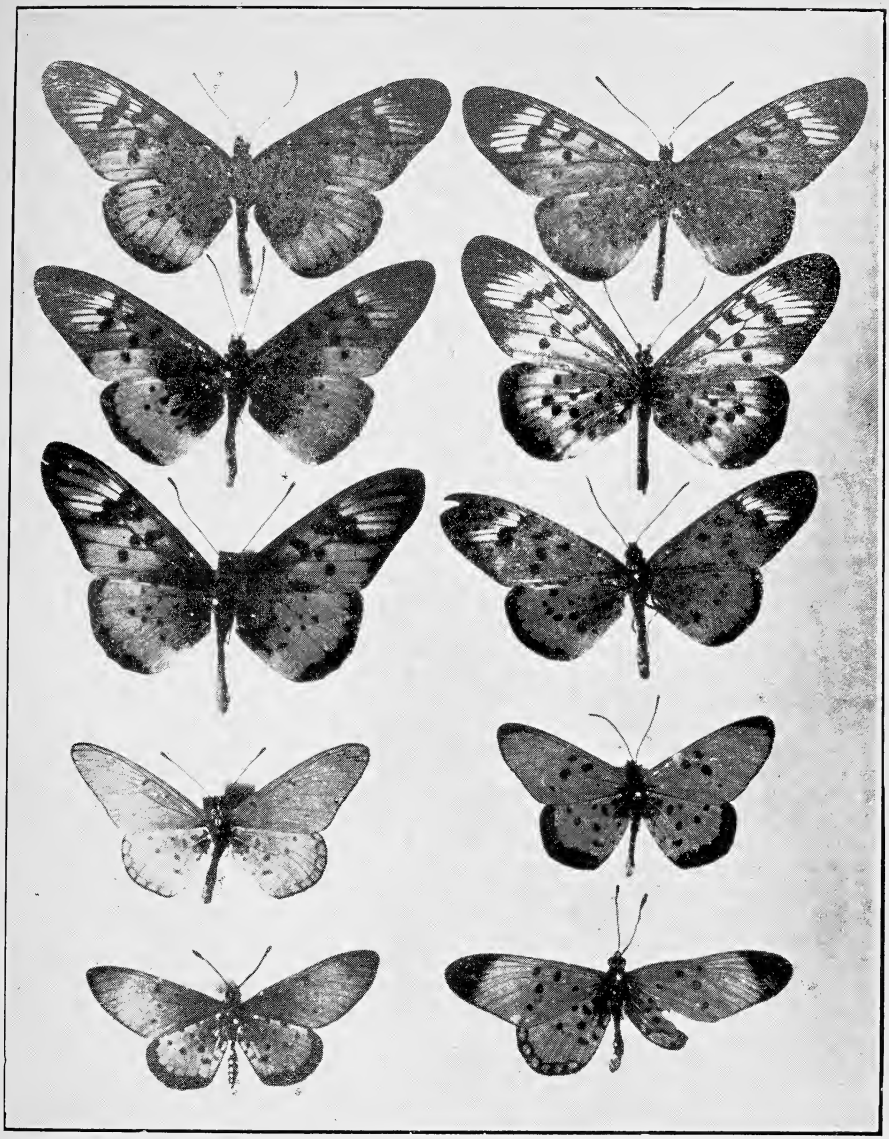

Photo: V. G. L. VAN SOMEREN.

PL. VIII.

Upper surfaces.

Fig. 1 Acræa egina egina. (Male).
Fig. 2. Acræa egina egina. (Female).
Fig. 3. Acræa egina harrisoni. (Male).
Fig. 4. Acræa egina, var. (Female).
Fig. 5. Acræa egina areca. (Male).
Fig. 6. Acræa egina harrisoni. (Female).
Fig. 7 Acræa acrita pudorina. (Male).
Fig 9. Acræa acrita acrita. (Male).
Fig. 8. Acræa acrita pudorina. (Female).
Fig. 10. Acræa acrita ambigua. (Male).

wing well beyond the cell and is sometimes continuous with a black spot in 3. A narrow line, or less frequently a large black spot, is placed at the apex of the cell on discocellulars. A large black spot is present in area 2 and a spot of variable shape is usually seen in 1b.

H.w. Brick-red with a pinkish bloom. A broad hind marginal border, the inner edge of which is sometimes dentate, is continued up the inner margin as a narrow edge. The outer edge of the border is decorated with white in the internervular areas. Many specimens have indications of faint spots on the margin. Base of wing suffused with black. The red area is usually without spots but if present they are small and situated in 5. 6, and 7.

Underside: F.w. as above but paler orange; the sub-apical area tinged with white scales. H.w. Black area as above; margin with eight distinct spots; white on edge marked. Two spots in 1b, one each in other areas. A narrow white line is present in 1a near the margin. Discal area pink margined with red except along the costa. Basal area black with white spots.

FEMALE:

Distribution of marks as in the male but the orange and red areas are much paler and duller. There are several varieties of females. A not uncommon form has the costa broadly black, the basal black extending further into the cell and in 1b to well beyond origin of nervure 2; the sub-apical black bar extends into the cell and is thus continuous with the discocellulars. This variety usually has a dull greyish suffusion over both wings. A further variety (see Pl. VII., fig. 5) has practically the same appearance as the preceding but in addition has a deeply serrated inner edge to the hind-wing margin; and has parallel to this a series of 7 black spots. This approaches the form *dubiosa*, Suffert.

EARLY STAGES:

Eggs yellowish cream, laid in batches on a vine (un-named). Larva first brownish, becoming yellow on the first four segments, and the last two, and red-brown on intermediate ones. Spines long and branched, those on segment two being the longest. Pupa white with nervular marks on the wing cases, and the usual abdominal black marks with orange spots.

DISTRIBUTION:

Coastal forests of Kenia, inland to Ukambani. The species also frequents the scrub and bush country. A form named *interrupta* occurs in Uganda, but we have not taken it. It differs from the typical in having the orange of the forewing extending into the cell as a wedge.

This butterfly is common throughout the whole of its range.

23. *ACRÆA PSEUDOLYCIA f. ASTRIGERA*, Butl. Pl. VII., fig. 6. Pl. IX., fig. 7.

Length of F.w. 35-38 mm. General colour orange and red with black marks, thus very like the preceding.

F.w. deep orange-red with basal black suffusion restricted. Costa narrowly black expanding to form a wide apical mark and continued down the outer margin in diminishing width.

Cell with triangular mark at base followed by two spots, one sub-basal the other about the middle. A small black spot is present on the discocellulars. A wide black oblique bar commences under the costa at a little beyond the cell and extends to nervure 4. Directly under this is a spot in 3. Areas 1b and 2 each contain a spot in a straight line between the hind angle and the spot on the discocellulars. There is sometimes an indistinct spot, sub-marginal, in Ib. A white fringe is present in the internervular spaces. H.w. rosy-red wth black basal patch. Marginal border black with distinct though small white spots. Black discal spots are present in areas 7 to 2. Fringe white.

Underside: F.w. orange with sub-apical white patch with orange triangular spots at apex and margin. Spots as on upperside. H.w. whitish-pink edged with rosy-red; margin and base black, both with white spots. Spots as above with in addition, two small in Ib, one in Ic.

FEMALE:

Duller and paler than the male, and whiter on the underside. Marks as in the male.

EARLY STAGES:

Unknown.

DISTRIBUTION:

Astrigera is found from the Coast north through Ukambani (Machakos, Kitui) to Fort Hall and Meru. It is fairly plentiful at Machakos and keeps to the bush country.

24. *ACRÆA PSEUDOLYCIA f. BRUNNEA*, Eltr. Pl. VII., fig. 7. Pl. IX., fig. 6.

Length of F.w. 33-38 mm. Differs from *astrigera* in having the orange and red replaced by brownish-ochreous, with a suffusion of white sub-apically.. The female has a very wide black hind-wing border.

DISTRIBUTION:

Uganda from Toro to Jinja. Has been recorded from Kitui in Ukambani.

25. *ACRÆA EGINA EGINA*, Cramer. Pl. VIII., figs. 1 & 2. Pl. XI., figs. 1 & 4.

Length of F.w. 38-42 mm. General colour black with red in hindwing.

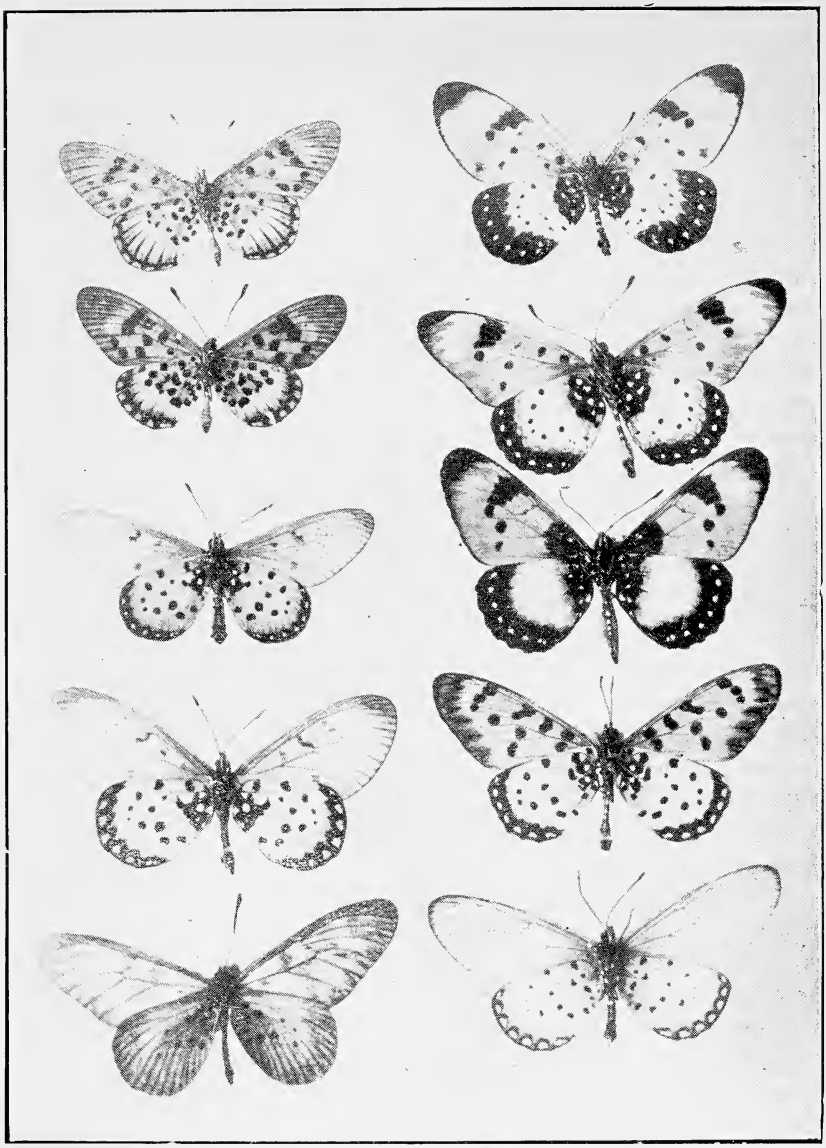

Photo: V. G. L. VAN SOMEREN.

PL. IX.

Under surfaces.

Fig. 1. Acræa petrea. (Male).
Fig. 2. Acræa cepheus. (Male).
Fig. 3. Acræa neobule. (Male).
Fig. 4. Acræa neobule. (Female).
Fig. 5. Acræa vesperalis.
Fig 6. Acræa pseudolycia brunnea.
Fig. 7. Acræa pseudolycia astrigera.
Fig. 8 Acræa anemosa.
Fig. 9. Acræa chilo. (Male).
Fig. 10. Acræa chilo. (Female).

F.w. Brownish black, thinly scaled in upper half of wing, so that the veins and spots are distinct. Areas Ia and Ib bright red from just beyond centre to hind angle. Black spots as follows: One in cell, one at end of cell. Five contiguous spots forming an oblique irregular bar from base of 7 to mid 3; one towards the base in 2 and one in red area of Ib.

H.w. bright red; black basal areas extensive and reaching almost to end of cell. Black marginal border with black extending up the veins, thus giving outer edge of red area a dentate outline. Black spots not very distinct being partly covered over by basal suffusion. (See underside).

Underside: F.w. greyish-brown with internervular rays distinct. Areas Ia and Ib dull orange-pink. Ib with two spots, the outer as above, the inner just internal to origin of vein 2. Other spots as seen above with two very small ones at base of costa.

H.w.: Marginal border black, with extensions up the veins, containing 7 quadrate greenish-white spots. Within this border and to about mid-line of wing, pinkish, with orange spots and rays internal to border, and beyond apex to cell. This pinkish gradually shades into greenish-grey. Extreme base red. Spots as follows: Discal spots present in areas 7, 6, 4 to Ib, those of 2 and 3 being basal. Two spots are present at the upper part of apex of cell, one on either side of vein 5. Two spots in cell; and one each at base of area 7 and 8; two spots at base Ib.

FEMALE:

F.w. Sepia to dull greyish-brown with the basal half sometimes pinkish or orang. A white or yellowish sub-apical oblique bar extends from costa to blackish margin. Spots as in the male but not so black. There is usually an invasion of the marginal blackish into the outer third area 2.

H.w. reddish orange with brownish suffusion at base. Marginal border blackish brown. Spots as in the male though more distinct.

Underside F.w.: Basal half dull orange-pink; apical third greenish-grey with long internervular rays of orange. Spots as above. H.w. as in the male but less strongly marked.

EARLY STAGES:

The eggs are creamy-white and are laid in batches on the leaves of a plant called "Magungwa." Young larvæ are sepia, while the fully fed larva is as follows; dorsum yellowish with transverse black and orange lines; sides blackih or brownish with a body line of broken linear spots; undersurface of body, yellowish. Fore-legs blackish, hind yellowish, black tipped. Spines long and black. Pupa elongate with the usual black markings, but central spots white, not orange.

DISTRIBUTION:

Uganda from Toro to Elgon where it meets the form *harrisoni*. The species is very common along the edges of forests and along roads that traverse them. The male are frequently seen in numbers at damp mud.

26. *ACRÆA EGINA ARECA*, E. M. Sharpe. Pl. VIII., fig. 5 Pl. XI., fig. 3.

Length of F.w. 35-40 mm. F.w. Deep to pale orange-red. Base costa, apex and margin brown-black. A large oblique spot in cell with another at apex adjoining a discal series in 6 to 3. Just beyond this is a pale area. Large distinct internervular red rays fill the sub-apical portion of the wing. A large black spot is situated at the base of area 2 and a larger one in the centre of the red patch and one sub-basal in Ib.

H.w.: As in typical form but with less black at the base.

Underside: F.w. greenish-grey at base merging into dull orange. Veins blackish; internervular rays orange. Spots as above. H.w. Base dull red followed by a greenish-grey zone; central area dull orange. Between this and the marginal border, the wing is pink shading into orange at the inner edge of border. Border black with large quadrate greenish-white spots. Spots as in previous form.

FEMALE:

Somewhat like the typical race, but more pinkish-orange in the forewing and with a more distinct white sub-apical bar.

Underside: Ground colour greenish-grey, otherwise very like the male.

EARLY STAGES:

Similar to typical race.

DISTRIBUTION:

Coastal area inland to Ukambani.

27. *ACRÆA EGINA HARRISONI*, E. M. Sharpe. Pl. VIII., figs. 3 & 6. Pl. X., figs. 2 & 5.

Length of F.w. 38-42 mm. This race is very near the typical, but has more red on the hindwing and the forewing is ornamented with distinct though narrow internervular streaks in areas 2—6.

The underside is more strongly coloured and dusted over with orange.

DISTRIBUTION:

Most frequently taken in the Elgon Nandi area but also extends into Uganda.

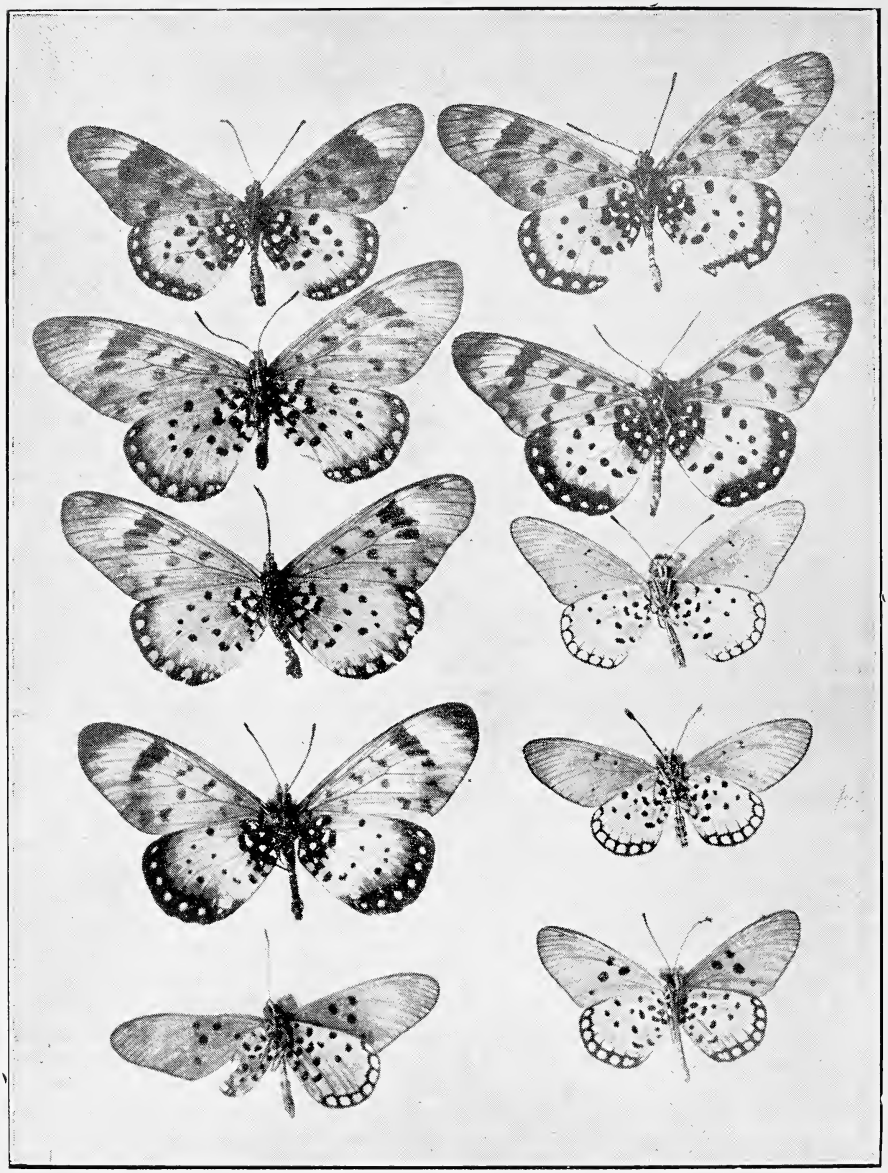

Photo: V. G. L. VAN SOMEREN.

PL. X.

Under surfaces.

Fig. 1. Acræa zetes f. menippe. (Male).
Fig. 2. Acræ zetes f. menippe. (Female).
Fig. 3. Acræa zetes jalema. (Female).
Fig. 4. Acræa zetes acara. (Female).
Fig. 5. Acræa zetes f. jalema. (Male).
Fig. 6. Acræa zetes acara. (Male).
Fig. 7. Acræa acrita pudorina. (Male).
Fig. 9. Acræa acrita ambigua. (Male).
Fig. 10. Acræ acrita acrita. (Male).

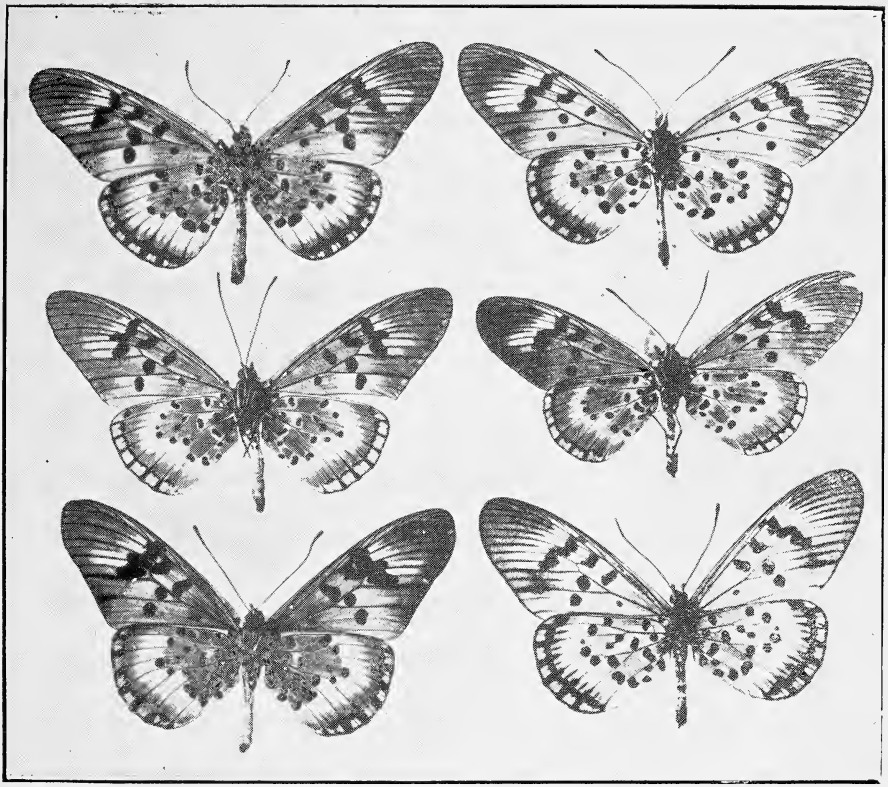

Photo: V. G. L. VAN SOMEREN.

PL. XI.

Under surfaces.

Fig. 1. Acræa egina egina. (Male).
Fig. 2. Acræa egina harrisoni. (Male)
Fig. 3. Acræa egina areca. (Male).
Fig. 4. Acræa egina egina. (Female).
Fig. 5. Acræa egina harrisoni (Female).
Fig. 6. Acræa egina, var. (Female).

There is an interesting form of female which occurs on Bugalla Island of the Sesse Group, in association with *Planema albicolor*. In this form the entire orange-brown or red is replaced by white and the black by brownish. It is like the form *medea*, Cram, but the spotting is smaller.

28. *ACRÆA CEPHEUS*, Linnæus. Pl. VII., fig. 9. Pl. IX., fig. 2.

Length of F.w. 28-30 mm. General colour vermilion-red with numerous black spots.

F.w. Vermilion-red; costa and margin brownish-black; apex broadly black. Cell with three spots, one linear at base, one transverse at about middle, one at apex adjoining a large oblique bar in the discocellulars. Area 2 contains two spots, one basal, the other adjacent to the black border. There are two spots in area Ib marginal and submarginal, and a third towards the base and joined to it by a linear mark.

H.w. Orange-red or vermilion, marginal border black; a slight basal black suffusion. Spots numerous: area 7 contains three, one marginal, one sub-basal, and the third midway between; area 6 has a spot sub-basally; two spots in area 5, one central, one basal; one at base of 4; a small one in 3; a large one at base of 2; one at about middle of Ic followed by two in the black suffusion at base. There are four small spots in Ib. The cell contains one basal, and one at about the middle.

Underside: Forewing dull orange-pink with spots as above with an addition a small spot in cell towards the base. Apex and margin ochreous with black internervular rays. H.w. ochreous with pinkish tinge; bases of areas 7-5, apex of cell and mid-area of Ib, orange pink. Spots as above with an extra one in 8. Marginal-border black, inwardly edged with orange and containing internervular whitish or ochreous quadrate spots.

FEMALE:

We have no female and so quote from Eltringham, l.c.

" Sepia-black. F.w. spots as in the male. An oblique white sub-apical band in 6, 5, 4, and 3 H.w. usually without basal suffusion. Black hind-mrginal border with internervular quadrate spots of the somewhat paler ground-colour.

Underside: F.w. greyish-mauve; costa, apex, and hind margin sage-green with black nervules and rays. Spots often smaller, those near base may be very minute. H.w. sage-green spotted as in the male . . . . "

EARLY STAGES:

Unknown.

DISTRIBUTION:

This species has been taken at Lake Albert, Uganda.

29. ACRÆA PETRÆA, Boisdv. Pl. VII., fig. 8. Pl. IX., fig. 1.

Length of F.w. 30-33 mm. General colour rosy-pink with black spots.

F.w. Rosy-red when fresh, becoming pink with age. Base slightly suffused with blackish. Costa black. Marginal border narrowly black but with this colour extending inwards along the nervures as linear streaks on 5 and 6 and triangular on 1—4. Areas 1b, 2, and 3 contain sub-marginal black spots lying parallel to the margin.

An oblique black bar traverses the discocellulars; the cell contains three spots, one at apex, one above origin vein 2, and a small dot more basally. Directly above these is a linear spot sub-costal. H.w. rosy-red; marginal border black with marked nervular black rays deeply indenting the rosy area. Base with slight black suffusion. Spots arranged thus: Two spots in 7; one each, sub-basally in 6 and 5; one each basally in 4 and 2; two in 1c one sub-basal, one just beyond the middle; 4 in 1b.

Underside: F.w. orange-pink. Spots as above with an extra spot on costa, nervular lines black, internervular rays orange. H.w. pink with orange-red marks at bases of 7-5, at apex of cell, and mid-area 1b. Marginal border with black loops enclosing greenish-grey spots. Nervures marked in black, internervular rays orange-red. Spots as above, with additional spots in 1b and 8.

FEMALE:

Like the male but duller and with a white sub-apical bar.

EARLY STAGES:

Not bred by us, but Fawcett describes them as follows: "Ground colour pale golden-brown, with dorsal and lateral black lines, and a black transvers line on each segment bearing two largish white spots and six long branched spines, those on third, fourth and fifth segments being longer than the remainedr. Head large proportionately to body, black with a white bifid mark on front . . . . . Pupa: pale brown, others ferruginous; in both forms the fine black lines and spots peculiar to Acræa pupæ are much reduced. . . . ."

DISTRIBUTION:

Taken only at Rabai. This species would appear to be rare within Kenya limits.

30. ACRÆA ROHLFSI, Suffert. Not figured.

Expanse 46 m.m. As we have no example of this species, we quote from Eltringham, 1c.: "Expanse 46 mm. F.w. bright brick-

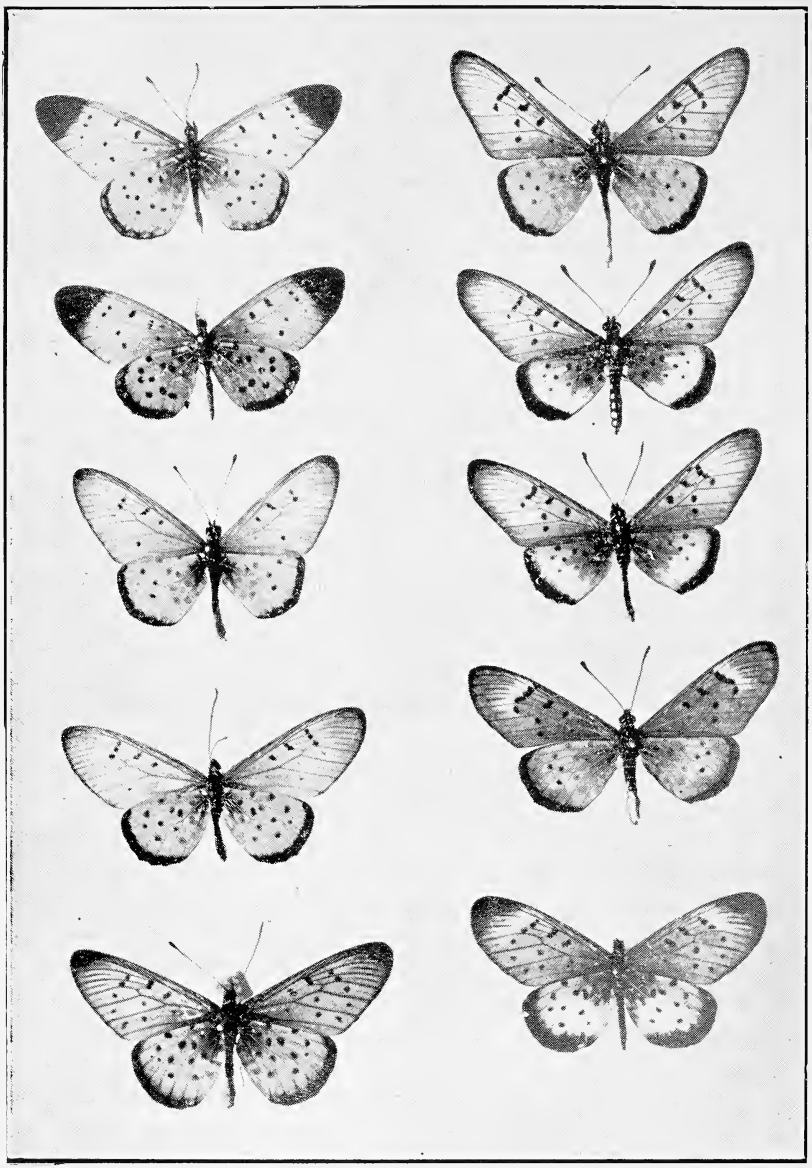

Photo: V. G. L. van Someren.

PL. XII.

Upper surfaces.

Fig. 1. Acræ caldarena caldarena. (Male).
Fig. 2. Acræa caldarena caldarena. (Female).
Fig. 3. Acræa pudorella pudorella. (Male).
Fig. 4. Acræa pudorella pudorella.
Fig. 5. Acræ oncæa. (Male).
Fig. 6. Acræ bræsia bræsia. (Male).
Fig. 7. Acræa bræsia bræsia. (Female).
Fig. 8. Acræa bræsia bræsia. (Female).
Fig. 9. Acræa bræsia, f. regalis. (Male).
Fig. 10. Acræa oncæa. (Female).

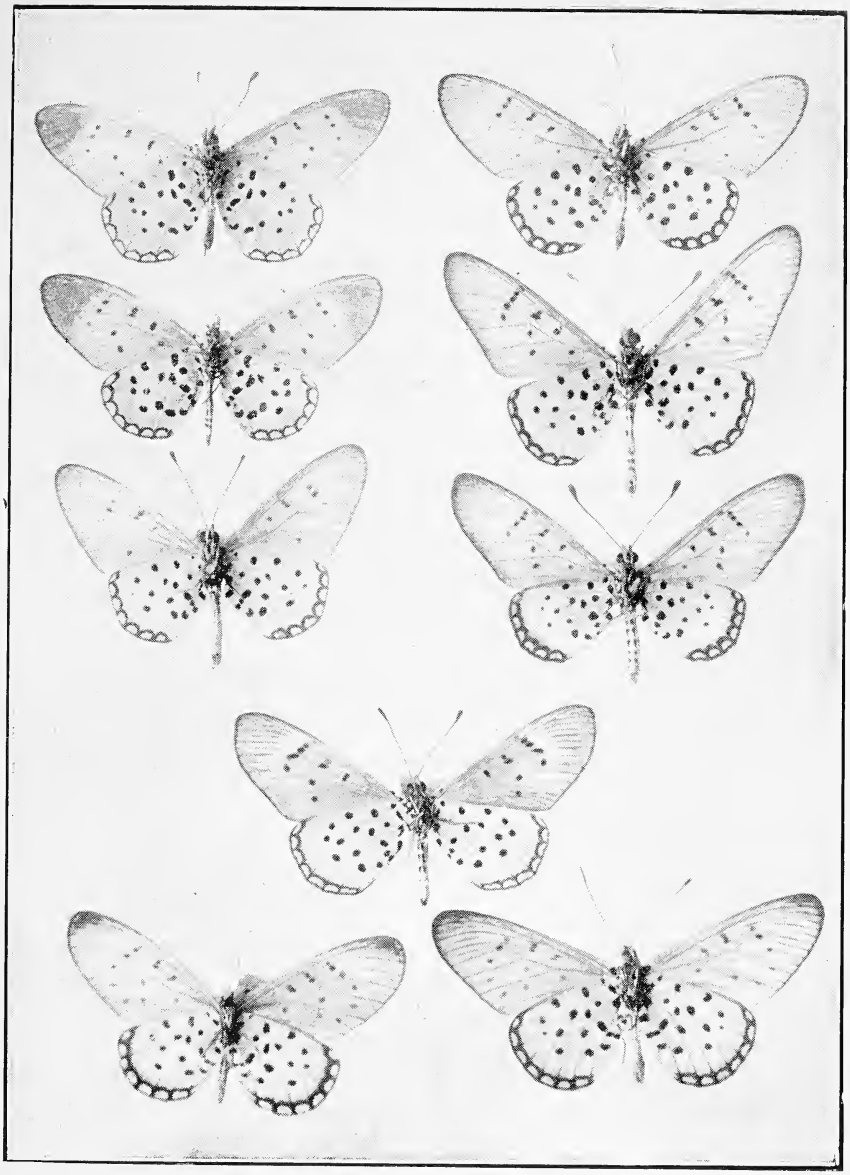

Photo: V. G. L. van Someren.

PL. XIII.

Under surfaces.

Fig. 1. Acræa caldarena caldarena. (Male).

Fig. 2. Acræa caldarena caldarena.

Fig. 3. Acræa pudorella pudorella.

Fig. 4. Acræa pudorella pudorella. (Female).

Fig. 5. Acræa bræsia bræsia. (Male).

Fig. 6. Acræa bræsia bræsia. (Female).

Fig. 7. Acræa bræsia f. regalis. (Male).

Fig. 8. Acræa oncæa. (Female).

Fig. 9. Acræa oncæa. (Male).

red. A narrow black border round costa apex and hind margin, continued as a black line along inner margin. A little black suffusion at base especially in Ia and Ib. Nervures black. The nervular ends rather broadly black, widening somewhat where they reach the hind margin so that the ground colour is divided up into broad clavate streaks. Black spots as follows:—A large spot in cell over origin nervule 2, a spot on the discocellulars, and beyond cell a band of large spots extending from black costa into area 3, the spot in this area being nearly separated from those above it. In 2 and Ib two small sub-marginal spots lying parallel to hind margin. In 2 also a large spot touching median, 3, and 2, and beneath it but nearer margin a spot placed in a line with that in 3 parallel to hind margin. A small spot in Ib nearly midway between base and origin of nervule 2. H.w. bright brick-red with a little black at base in Ic, Ib, Ia. A narrow black marginal border the inner edge of which, between the nervules is straight, and narrowly edentate on the nervules. Black spots as on underside.

Underside: F.w. dull brick-red with black spots as above. Costa and hindmargin only slightly darkened. Nervules grey black, and internervular rays at apex inclining to orange.

H.w. yellowish pink, the basal half inclined to reddish. A very narrow grey hind-marginal border, inwardly edged with orange-red internervular marks twice the width of the border. Nervule ends black. Black spots as follows:—One at base in area 9, three equi-distant spots in 7, the second just beyond origin of nervule 7. Between and beneath the two more distal of these, a small spot in 6, and beneath it but slightly nearer margin a small spot in 5. One at base of 4, 3, and 2 all touching cell. Beneath that in 2 but nearer margin a large spot in Ic and a second at the same level in Ib. Also two spots in cell, the second rather oblique, its lower and touching median just beyond origin of nervule 3. A basal and sub-basal in Ic and Ia and a sub-basal in Ib."

EARLY STAGES:

Unknown.

DISTRIBUTION:

Ukwerewe Island, Victoria Nyanza. We have included this species as it probably occurs on the mainland also.

31. *ACRÆA ACRITA PUDORINA*, Staud. Pl. VIII., figs. 7 & 8. Pl. X., figs. 7 & 8.

Length of F.w. 28-32 mm. General colour fiery-orange.

F.w. very pointed, orange red at base grading to flame and orange at apex. Costa, apex and outer margin narrowly margined with black. Spots very indistinct; one in cell, one in 2 and one also in Ib.

H.w. flame colour and pinkish bloom. Margin narrowly black. Restricted area at base black. Spots and marginal loops indistinct. Sometimes 2 or 3 small sub-apical spots, especially in female.

Underside: F.w. basal 2/3 orange-red fading to orange. Apex yellowish ochre with orange internervular streaks. Spots as above. H.w. orange-ochre with red blotches at bases of 8, 7, 5, and apex of cell and mid-area in Ib and c. Marginal border consists of a series of loops enclosing ochre-white spots. A trace of orange internervular rays internal to border, more particularly at the anal angle. Black spots as follows:—Two in 7, one sub-basal, the other at about the middle, one in 6 towards middle, one at origin of vein 6; one each basally in 6 and 3; three in Ic, one basal, one sub-basal, one just beyond mid-point; three small spots in Ib. The cell contains two spots, one circular at base one transverse at about centre.

The above description applies to an average " dry season " male but as the seasonal variations are not sharply defined in Kenia some modification will be necessary for intermediate varieties.

A " wet season " male has the fore-wing spots larger and more distinct and the hind-wing marginal border is wider. It is not so bright orange-red.

Female:

F.w. dull ochreous with greyish tinge; base smoky; a trace of a pale sub-apical bar. Costa, apex and margin black. Spots as in the male but more distinct. H.w. ground colour as fore-wing with a pinkish tinge especially towards inner border. Marginal border with wide blackish loops enclosing greyish spots. Black spots clear and as in the male. (Lower surface).

Underside: Ground colour dull ochre in f.w. becoming paler, more whitish at apex, with orange rays. Spots as above. H.w. as in the male but duller and the spots and border larger.

Early Stages:

Unknown.

Distribution:

Kenia, from the Coast to Mau and Kavirondo, Nandi.

32. ACRÆA ACRITA AMBIGUA, Trimen. Pls. Figs.

Length of F.w. 30-32 mm. This race is included on the evidence of a single male from near Taveta. It differs from the common form in being less richly flame colour, especially in the sub-apical area which is light orange, and in having a broad black tip to the f.w. The spots of both wings are large and distinct and the hind-marginal border is blacker and wider, enclosing orange spots. There is more dark

suffusion at the base. The underside is altogether more yellowish orange and a spotting and marginal border darker, as above.

33. ACRÆA ACRITA ACRITA Hewitson. Pl. VII., fig. 9. Pl. X., fig. 10.

Length of F.w. 28-30 mm. General colour as in the above form, but with only a narrow black area on the upper part of tip of F.w. The marginal border of the hindwing is wider and black with faint indications of yellowish spots. The spots in both fore and hindwings are larger.

This form reaches the Southern Masai district but is certainly not common in Kenya.

34. ACRÆA CALDARENA CALDARENA, Hewitson. Pl. XII., figs. 1 & 2. Pl. XIII., figs. 1 & 2.

Length of F.w. 30-32 mm.. General colour rosy-pink with small black spots.

F.w. Creamy-pink to ochreous-pink. Costa and margin very narrowly black. A wide black apex at tip of wing. Basal area slightly dusky.

Spots as follows: One in cell above origin V.2.; one at apex of cell on discocellulars. Just internal to the black tip, a row of three to four spots forming an oblique row; a sub-basal spot in 2 and three spots in Ib, one sub-basal, one sub-marginal and one slightly internal to this.

H.w. pinkish with a slight basal suffusion. A narrow black border of arches enclosing pink spots. Spots as under, though not so clear.

Underside: F.w. pinkish ochreous with a greyish tip, this latter with pale orange internervular rays. Spots as above. H.w. ochre-pink with pink area at base. Margin ochreous with black arches and narrow edge. Fringe white Spots as folows, each outlined with ochreous: Two spots in 8; two large ones in 7; one mid-way in 6; two in 5, one basal, one midway; one basal in 4; one each placed sub-basally in 3 and 2; three in Ic, one at base, one above origin of vein 2 and one mid-way betwen this and margin. There are four spots in Ib.

FEMALE:

Very like the male but duller, more ochreous and less pink. Distribution of marking similar, but all spots are larger. The hind-marginal border is practically uniform black, there being only a faint trace of internervular spots. Underside as in the male but spots larger.

Early Stages:

Eggs white or cream, long barrel-shaped, slightly more tapering at upper end. Grooves in long axis and transvers. Larva reddish-pink with paler more yellow extremities. (Anterior, first four: last two). Underside whitish. Spines black. Pupa moderately elongate, white or cream with usual *acræa* marks on wing cases and broad marks on abdominal segments. There is some variation in the density of these black markings.

Distribution:

This form occurs in the Kavirondo Nandi district in some numbers, and has been taken in Busoga, Uganda.

35. ACRÆA CALDARENA f. NELUSKA, Oberth.

Length of F.w. 25-32 mm. Male: Somewhat like the typical form but redder and with the apical patch much reduced. The spotting is not so distinct.

Female:

Very like the male but duller, with more suffusion on bases of fore and hindwings. The hindwing is brownish-red with a smoky suffusion. Spots as in inland form.

Distribution:

The Coastal districts, but not common.

36. ACRÆA PUDORELLA PUDORELLA, Auriv. Pl. XII., figs. 3 and 4; Pl. XIII., figs. 3 & 4.

Length of F.w. 28-30 m.m. General colour pinkish-red, rather transparent.

F.w. Ochreous pink, rather thinly scaled sub-apically. Costa, apex and margin narrowly black. Apical area with orange internervular rays. Cell with two spots, one central, one on discocellulars. Beyond this a series of four spots in an oblique row from 6-3. A single spot is spresent in Ib.

H.w. Ground colour as fore; narrow basal suffusion. Marginal border black with outer edges dentate. Spots indistinct and variable. (See underside).

Undersurface: F.w. with practically no scales. Spots as above, with an additional one at base of costa. H.w. pinkish, more reddish at base. Marginal border with black arches enclosing greenish-white spots. Spots as folows:—One in 8' at base; two in 7, one sub-basal, one about mid-way. One central in 6; two in 5, one basal, one slightly beyond middle; one each sub-basally in 4 and 2; one in 3 sub-basal; three in Ic, one basal, one at origin V2, one mid-way between this and marginal border. Ib with four spots.

Female:

Very like the male, but with heavier border to the hindwing.

Early Stages:

Unknown to us.

Coastal areas inland to Ukamb'ani and Loita, and as a stray to Nairobi.

37. ACRÆA BRÆSIA BRÆSIA, Godman. Pl. XII., figs. 6, 7, & 8. Pl. XIII., figs. 5 & 6.

Length of F.w. 30-32 mm. General colour pinkish with transparent forewings. F.w. Transparent towards apex, basally thinly scaled with rosy-brown. Sub-marginally and on hind margin reddish orange. Costa, apex and margin narrowly black. Spots as follows:—Two in cell, one at centre, one at apex on discocellulars. An oblique row of five discal spots, the lowest slightly internal, crosses the wing from 7-3. Area 2 contains a sub-basal spot while area 1b has two, one sub-basal, one about centre. H.w. ochre-pink with slight basal suffusion and black marginal border. Spots variable and not all distinct.

Underside: F.w. thinly scaled and very like upper side. H.w. ochre-pink, with slight white scaling, base reddish. Marginal arches enclosing pale ochreous spots. Spots as follows:—Area 8 with one spot; 7 with two spots, one sub-basal, one at about mid-costa; a single spot midway along 6; two in 5, one basal one towards marginal border; one each at bases of 4 and 2; one sub-basal in 3; three in 1c, one basal, one at level of vein 2,one half way between this and border. Four in 1b.

38. Male form *REGALIS*: In this form the fore-wing is more heavily scaled right up to the oblique row of spots, and has the sub-apical area greyish except for an oblique transparent bar distal to the black spots. Pl. XII., fig. 9. Pl. XIII., fig. 7.

The orange sub-marginal spots are more distinct. Otherwise it is very like typical *brœsia*. The underside however is paler especially on the hindwing, and the apex and margin are greyish with orange internervular streaks and spots, each streak blackish internally. The females are very variable from a form very like the male, but duller and with a whitish patch in hindwing, to the usual form found in Kenia which is more thinly scaled than the male and with reddish areas replaced by smoky grey-brown and with an almost pure white patch in the hindwing. Spots as in the male. The underside is as found in the form *regalis*.

Early Stages:

Unknown to us.

Distribution:

Coastal zone, inland to Mau. The form *regalis* is particularly plentiful in Taita, Ukambani and the Kedong.

39. ACRÆA DOUBLEDAYI SYKESI, E. M. Sharpe. Not figured.
= *MYSTICA*, Neave.

Expanse about 60 mm. The description of this species is taken from Eltringham, l.c. "Differs from typical doubledayi in having the f.w. of a yellower colour. The apical and marginal black is confined to the ends of the nervules and a thin marginal line, and the translucent patch is almost entirely absent. The ground-colour of the h.w. margin of the underside it white." The female is a tawny-brown with larger spots in the f.w.

Distribution:

Uganda, Entebbe to Nandi.

40. ACRÆA ONCÆA, Hopp. Pl. XII., figs. 5 & 10. Pl. XIII., figs. 8 & 9.

Length of F.w. 30-33 mm.. General colour pinkish with numerous black spots.

F.w. Orange-brown; black costa, apex and margin. Base dusky. Veins and internervular rays blackish on orange ground. Centre of wing not heavily scaled. Spots as follows:—Cell with one in centre; one on discocellulars. A series of five spots distal to the apex of the cell, the first three in line and set obliquely, the other two in Ib and 2 curving inwards to hind angle. A second spot is present in 2, sub-basally, and two others in Ib, one just internal and below origin V.2, the other directly below the sub-basal spot in 2. H.w. pink with basal suffusion and blackish marginal border, the black from this ascending the veins and indenting the pink area. Spots as under.

Underside: As above but duller and sparsely scaled. H.w. pink-ochre, reddish at base. Marginal loops enclosing ochreous spots. Sub-marginal rays pink. Spots as follows:—Two in 8; one sub-basal in 7. A row of discal spots commencing at mid 7 and following contour of wing to Ib, missing 2 and 4 in which the spots are basal. There is also a second spot at base of 5. Cell with two spots towards centre. Ia with a transverse spot at mid-margin and one sub-basal.

Female:

Spotted as in the male. Ground colour variable, usually dull ochre-brown in F.w. ,with a wide blackish tip and white sub-apical

bar, pinkish inclining to white towards the inner margin in H.w. with a broad marginal border. Underside spotted as in the male, but ground colour paler, more whitish.

EARLY STAGES:

Unknown to us.

DISTRIBUTION:

Common along the Coast.

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EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY

INDEX

Vol. VII. Parts 1—4.

Containing 43 half-tone plates, 15 line-drawings.

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Part 1 (pages 1— 27)	January, 1926
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LIST OF CONTRIBUTORS.

Vol. VII.

Parts 1—4.

CONTENTS OF VOLUME VII.

No. 1.

No. 2.

No. 3.

No. 4.

ERRATA.

Part I.

Page 23, line 8. For "rport" read "report."
Page 26, line 37. For "Togomada" read "Togomda."
Page 48, line 30. For "chaetops" read "chaetopus."
Page 49, line 32. For "gedgei" read "gedgii."
Page 55, line 1. For "squanatus" read "squamatus."

Part II.

Page 74, line 6. For "diara" read "daira."
Page 82, Plate XIII, insert "Fig. 7, Acraea acerata (male)."

Part III.

Page 103, line 35. For "trops" read "troops."
Page 105, line 38. For "Manaseh" read "Manasseh"
Page 111, line 38. For "Masaai" read "Maasai."
Page 116, line 40. For "af" read "of."
Page 119, line 33. For "they" read "thy."
Page 121, line 13. Between "it" and "there" insert "is."
Page 123, line 20. For "stod" read "stood."
Page 140, line 15. For "montheism" read "monotheism"
Page 141, line 25. For "Assigi" read "asiggi."
Page 150, line 6. For "hisoric" read "historic."
Page 150, line 18. For "disserernment" read "disseverment."
Page 151, line 22. For "behavious" read "behaviour."
Page 152, line 34. For "a" read "at."
Page 157, line 23. For "srystal" read "crystal."
Page 160, line 21. For "inviolabe" read "inviolable."
Page 164, line 17. For "cananitish" read "canaanitish."
Page 172, line 23. For "gave" read "grave."
Page 173, line 16. Delete "have."
Page 187, line 33. For "bring" read "bringing."
Page 187, line 27. For "certain" read "certainly."
Page 195, line 20. For "he" read "the."

Part IV.

Page 199, line 22. For "naps" read "nape."
Page 201, line 23. For "colouer" read "colour."
Page 201, line 44. For "irish" read "iris."
Page 206, line 38. For "wiley" read "wily."
Page 213, line 38. For "larvae" read "larva."
Page 214, Plate XVIII, Fig. 4. For "parenna" read "perenna."
Page 217, Plate XIX, Figs. 1, 2, 3, 4. For "parenna" read "perenna."
Page 217, line 8. For "pharsalloides" read "pharsaloides."
Page 219, line 9. For "ilke" read "like."
Page 221, lines 17, 18. For "ocheous" read "ochreous."
Page 227, bottom, add "Distribution: Forests of Uganda east to Nandi."
Page 231, Plate XXV, fig. 5. Insert "Acraea amicitiae (male)."
Page 232, line 20. For "insect" read "insects."
Page 233, line 19. For "naple" read "naples."
Page 233, line 42. For "tanwy" read "tawny."
Page 235, line 9. For "fairy" read "fairly."
Page 235, line 25. For "ocheous" read "ochreous."
Page 236, line 39. For "plate XXI" read "Plate XXXI."
Page 236, Plate XXVIII, figs. 5, 6. For "aurivilii" read "aurivillii."
Page 237, Plate XXIX, figs. 3, 4, 5. For "dorothaee" read "dorothaea."
Page 237, line 6. For "dorsaly" read "dorsally."
Page 238, lines 3, 13, 19. For "dorothaee" read "dorothaea."
Page 238, line 23. For "esbria" read "esebria."
Page 238, Plate XXXI, Fig. 7. For "acraee" read "acraea."
Page 242, Plate XXXIII, Fig. 9. For "jomhstoni" read "johnstoni."
Page 244, line 18. For "sandrouse" read "sandgrouse."

LIST OF PLATES.

Vol. VII.

No. 2.

INDEX TO ILLUSTRATIONS.

GENERAL INDEX.

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CONTENTS.

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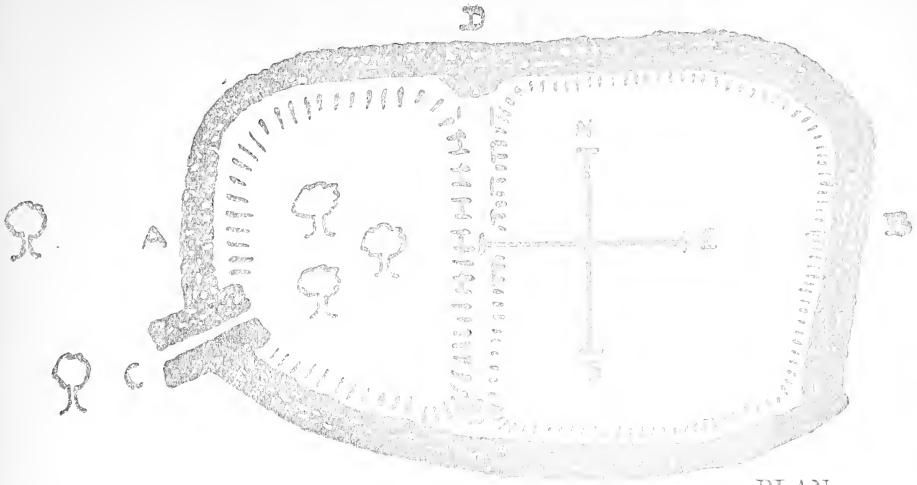
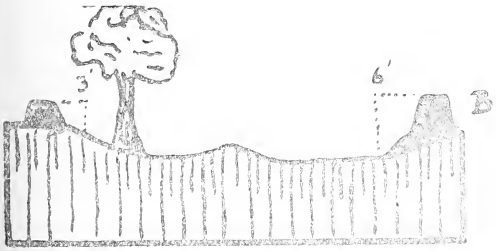
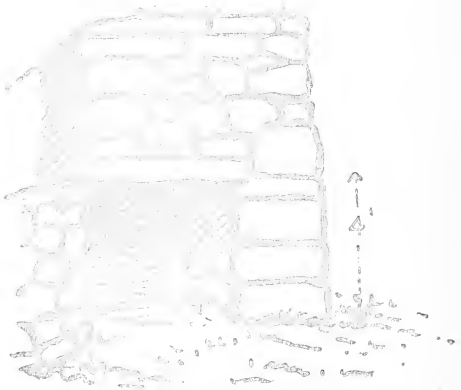


PLAN.

D-E, site of partition wall.



SECTION ON A—B.



ENTRANCE AT C.

Fig. 1.

Example of a stone enclosure, of type No. 1, on farm 906, Elgeyo border. G.H., March 31st, 1921.

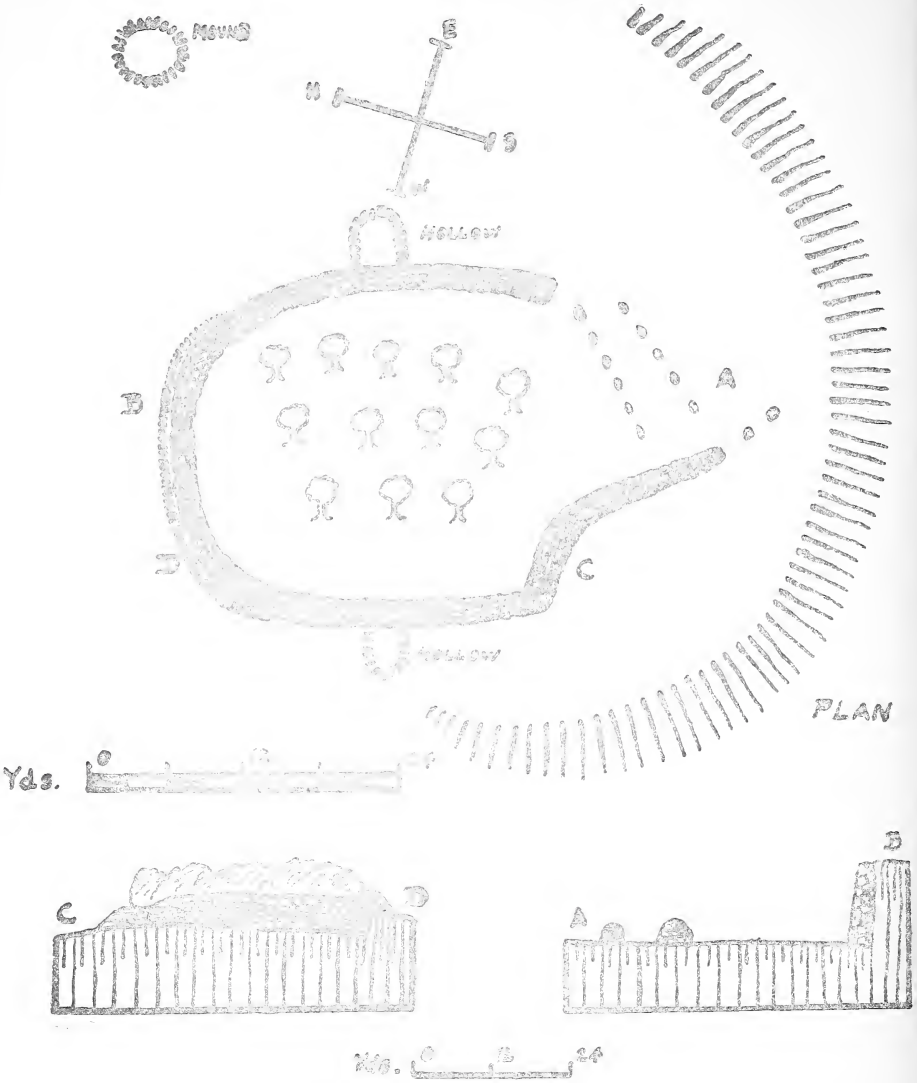


Fig. 2. SECTIONS ON A—B, C—D.

Example of stone enclosures of type No. 2, on farm 307, Elgeyo border. G.H., March 29th, 1921.

LOCAL ARCHÆOLOGY IN KENYA COLONY.

By G. W. B. Huntingford.

The study of local archæology in this country does not seem to have received the attention due to it; and while it is true that antiquities exist only in certain areas, the remains found therein provide material for a considerable amount of investigation, and it is to these remains that I wish to draw attention in this paper. The greater number of antiquities occur in the districts of Uasin-Gishu and Nandi, and extend south of Nandi into Kipsikis country, and, I believe, to the Tanganyika border. I have found no traces of monumental antiquities on or near Mount Elgon, nor have I observed any in Western Trans-Nzoia. The antiquities may be classed as:—(1) Enclosures of stone or earth; (2) Tumuli; (3) meini hirion or monoliths; (4) Roads; (5) Irrigation canals; (6) Graves. Those of the first class are by far the most numerous. It will be advisable to examine these remains separately.

(1). Enclosures of Stone or Earth.

These may be further sub-divided into (*a*) large stone enclosures; (*b*) hut-circles; (*c*) pit-villages.

(*a*) Large stone enclosures are most abundant on the Elgeyo border, the eastern side of the Uasin-Gishu plateau; they are also found sparingly on the central parts of the plateau, but are entirely absent in Nandi. Those in Elgeyo consist, roughly, of a more or less circular stone wall surrounding a slight hollow. They consist of three types: 1. Single enclosures with entrance passage; 2. Single enclosures without entrance passage; 3. Double enclosures. The following examples are situated on two farms not far apart. Type No. 1: On farm 906 is an enclosure with a continuous stone wall, still standing to a height of 6 ft. in one place, which encloses an area of about 150 square yards, the interior being divided into two equal parts by a ridge running across it from north to south, which appears from a small portion of wall projecting from the main wall at the north end, to be the remains of a partition wall. At the S.W. corner is a well-built and well preserved entrance passage, some 6ft. in length, with a passage way 4 ft. high; this passage is roofed with stone slabs, a super-structure in the form of partially bonded masonry being carried another 4 ft. above the roof of the passage. The whole circuit of the wall is free-standing. In the interior are

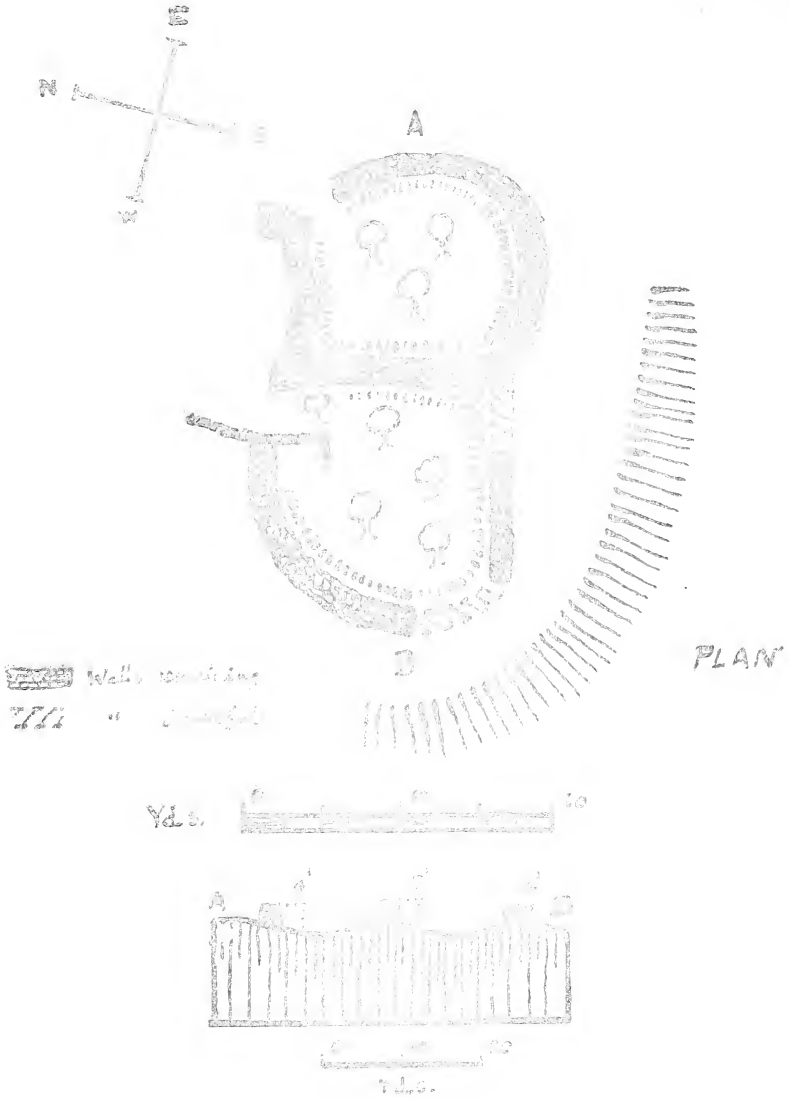
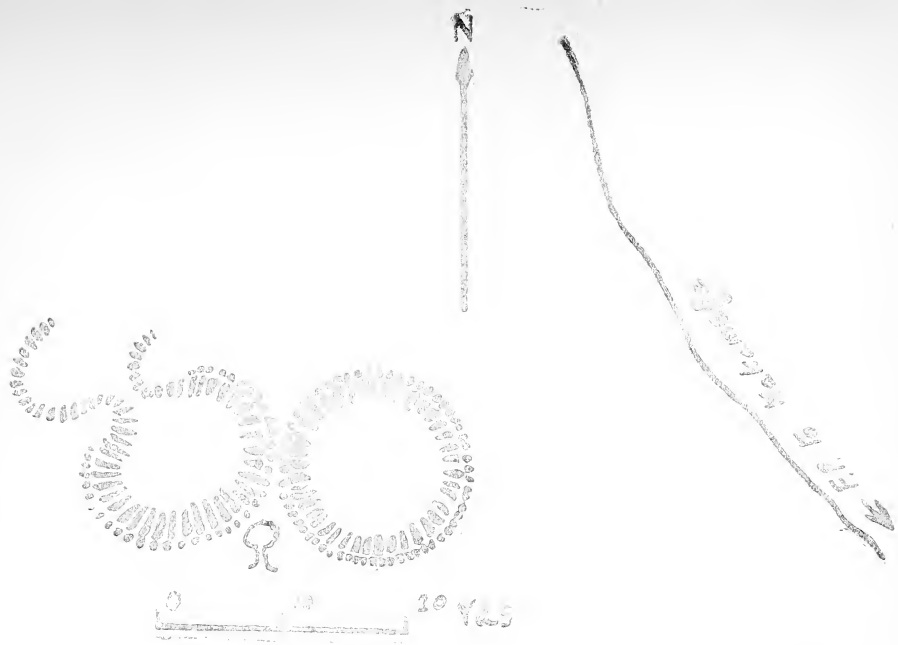
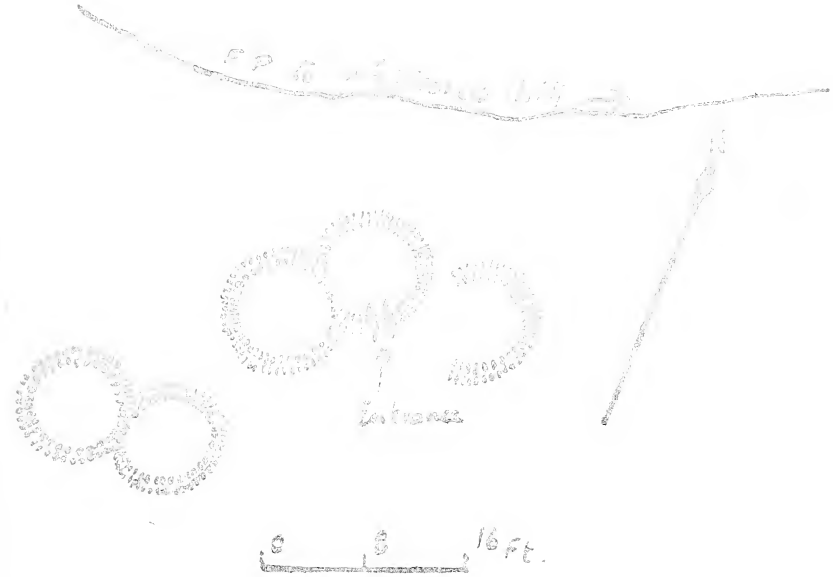


Fig. 3.

Example of stone enclosures of type No. 3, on farm 307, Elgeyo border. G.H., March 29th, 1921.



I. G.H., April 9th, 1922.

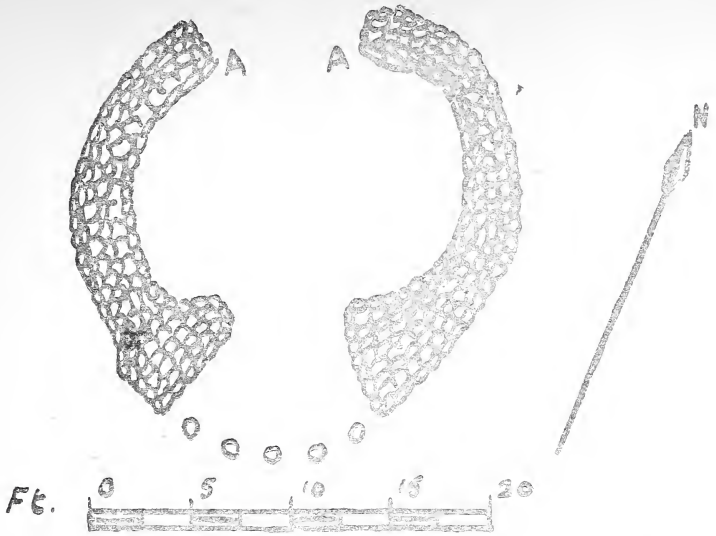


II. G.H., 1922.

Fig. 4. HUT CIRCLES:
Type No. i.
I. North-west of Sarura Hill, near Kipkaren.
II. West of Kâpkoros Hill, N.W. Nandi.

some well grown trees. Type No. 2: Some three or four miles from the foregoing, on farm 307, is a good example of this type. Here, on a small eminence, is a wall somewhat in the shape of a calabash, the ground-level of the interior sloping from north to south, with the result that the wall on the north is built wholly against the earth; it is some 5 ft. in height. The southern end, representing the neck of the calabash, is enclosed by two low and much-ruined stone walls, which are roughly parallel. The interior is filled with trees, some of them of considerable girth. Type No. 3: Within a short distance of this last, is a double enclosure, consisting of two irregular circles of stone walling. The eastern half is walled on all sides, and has a gap on the north side for an entrance, on one side of which a wall is built out for a few feet at a right angle to the main wall. The western half is now incomplete; but it seems to have had for its eastern wall the western wall of the other half. The entrance was on the north wall, one side being formed by the central wall, the other by a thin wall built at a right angle to the main wall, and extending both outwards and inwards for several feet. The floors of both halves are hollowed, and filled with trees. The central wall, at its highest, is 7 ft.; the other walls are 3-4 ft. in height; all are free-standing. The last two enclosures are at a considerable distance from a river; the first is close to, but at some height above, the Ellegirini river. It is probable that these structures were roofed—if they were roofed at all—with rafters and thatch; there are no indications visible of roofs of stone slabs, which, I am told, occur on the Nandi border. I was informed that a Dutchman once found a " stone axe " and a clay tobacco pipe in an enclosure on his farm; but I could not trace their present location. As to the object of these enclosures, it is difficult, without excavation, to determine. Though they may, at times, have been used as forts, it is not probable that they were built for that purpose: their disposition, the nature of the ground, and the analogy of similar structures in Britain, such as Grimspound on Dartmoor, and Caer Drewyn in the parish of Corwen, North Wales seem to preclude this theory. (R. Munro, Prehistoric Britain, 218; Royal Comm. on Anc. Monuments in Wales, Inv. Co. Merioneth, No. 37). And when it is considered that many of them are situated on the edge of the forest, in a region exposed to dangers both from wild beasts and hostile people, it seems probable that they were intened as cattle folds, and that the owners lived in them as well.

(*b*) Hut-circles occur in great numbers throughout the Eldoret area, and still more frequently in Nandi. They consist of three types: (1) a pit excavated in the ground; (2) a pit having its sides built up with stones; (3) a pit similar to No. 1, but with one or more small annexes. Type No. 1 is, on the whole, the commonest. It consists of a circular hollow excavated almost always on a slope, the floor being nearly level, and the entrance on the lower side, where on



G.H., March 12th, 1922.

Walling at A—A.

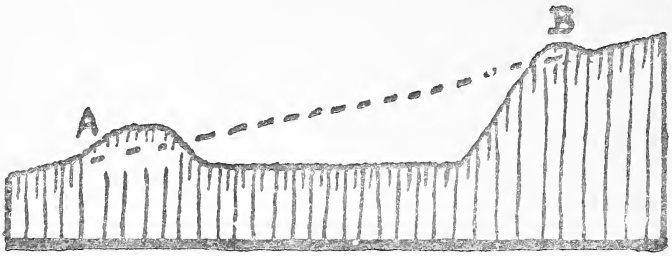
Fig. 5. Hut-circles: type No. ii., on S.E. slope of Chepesas Hill, Kipkaren.

G.H., March 25th, 1924.

Fig. 6. Hearth excavated in a hut-circle on farm 1726, on left bank of R. Kipkaren.

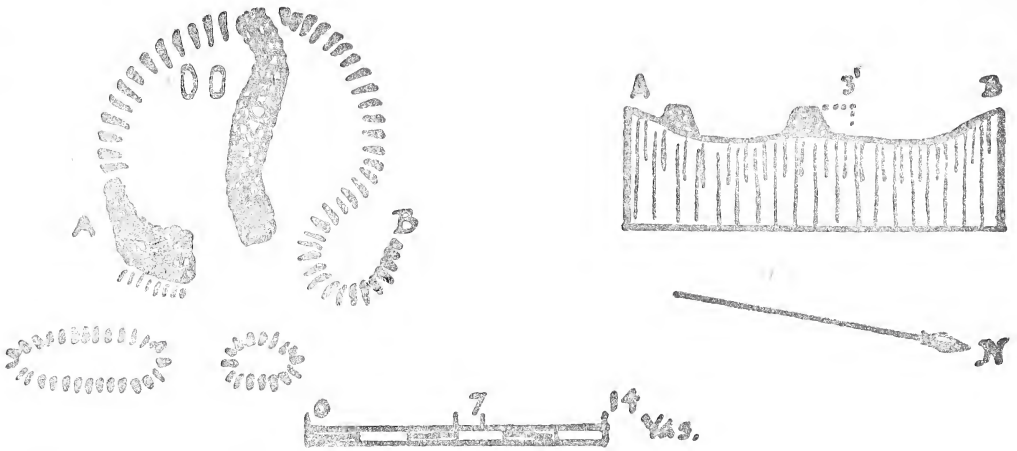
each side of the entrance, are frequently well-defined banks formed by the upcast from the excavation, and laid on either side of the entrance to form a low wall, thus:

A = Bank.
A-B = Original ground level.



This type of circle varies in diameter from 30 to 8 feet; and in depth from 4 to 5 feet. Some trial excavations made last year in a hut-circle on the left bank of the Kipkaren river resulted in the discovery of a number of fragments of pottery, which were found in the floor of the circle at depths varying from 12 to 24 inches. Nine pieces in all were found, being in colour, grey, grey-brown, reddish, reddish brown and reddish-grey. The ornamentation on one piece consisted of parallel straight lines. Three other pieces were also picked up outside this circle, on the surface; the ornamentation on them showing none of the characteristics of Nandi work. The texture, too, and the degree of burning, is different from any Nandi work that I have examined. Of course, till more pottery has been found, and the varieties examined and classified, it is impossible to form any definite opinion of these fragments; but I am convinced that they are not Nandi work. One feature of Nandi pottery is that in most cases it is only burnt half-way through, whereas these fragments were well burnt. At the same time as the discovery of the foregoing, a stone hearth was exposed in a neighbouring circle; it consisted of two main upright stones, about 12 inches high and the same distance apart, the intervening space being occupied by smaller stones laid flat on the ground.

A group of circles such as I have not seen elsewhere, is to be found near a rocky hill called Kâpkoros (=place of bonfires), which is incorrectly called Kimoror on the maps, some eight miles west of Sarura bridge. Here, on a neck of high ground, between the heads of two deep valleys, about 300 yards west of the summit of Kâpkoros, are five circular earth banks, each about one foot high, and with an internal diameter of 8 feet.



G.H., Mar. 12th, 1922.

Fig. 7. Hut-circle of type No. ii. on the E. slope of Kâpkaimur Hill, N. Nandi.

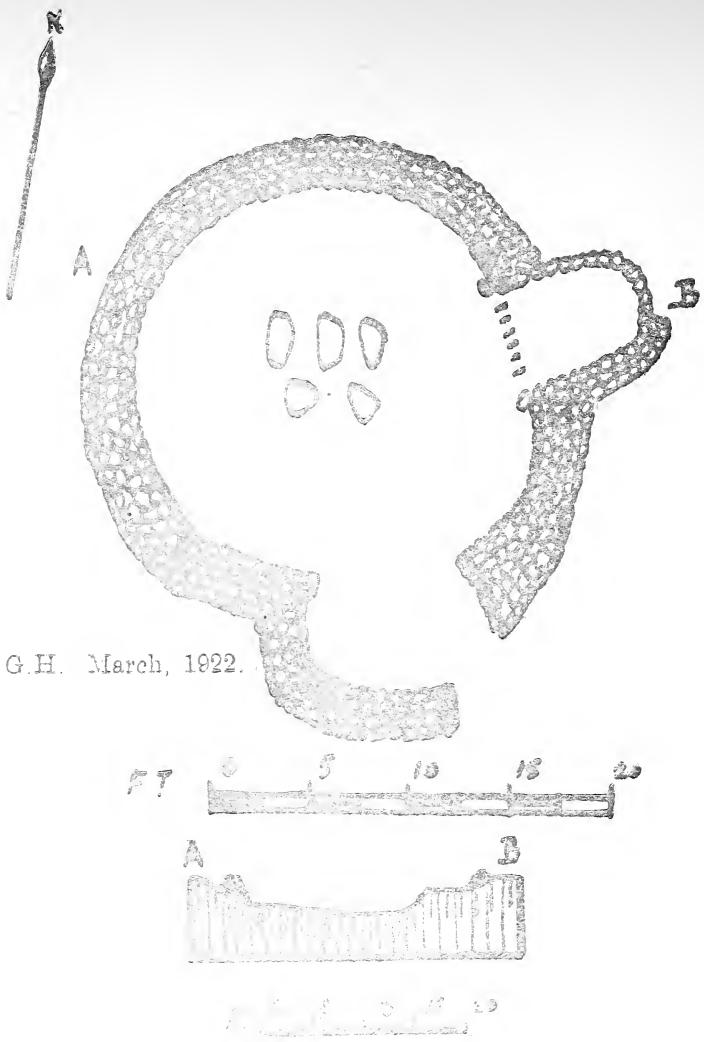


Fig. 8. Hut-circle of type No. iii. on the S.E. slope of Chepesas Hill, Kipkaren.

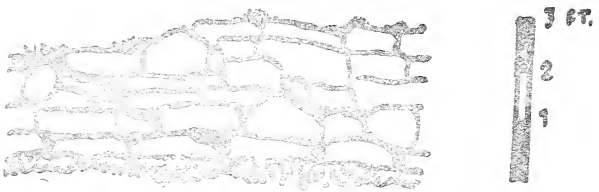


Fig. 8a. Walling in a hut-circle of type No. iii. on the W. side of Tuktuk Hill, Kipkaren. G.H., 1922.

Type No. 2 is not so common as the first type; nevertheless, there are a fair number of examples of it in north Nandi. The construction resembles that of No. 1, except that the sloping earth walls are faced with very rough stone walling. and the earth banks in front are, in some cases, replaced by stone ones. In some examples of this and the next type, the masonry is put together with considerable care, and some attempt is made at coursing and bonding. This type sometimes occurs divided into two parts by a wall of earth or stones, or of earth and stones mixed. Circles of this and the next type are similar in size, on the whole, to those of type No. 1, though a few are deeper.

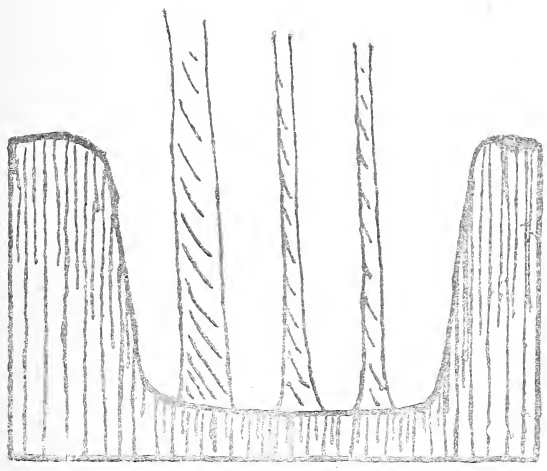
Type No. 3 as has already been said, has one or more annexes, which appear as semi-circular hollows at the side or back of a hut, sometimes lined with stone, sometimes not, and generally having their floors at a higher level than the hut floor.

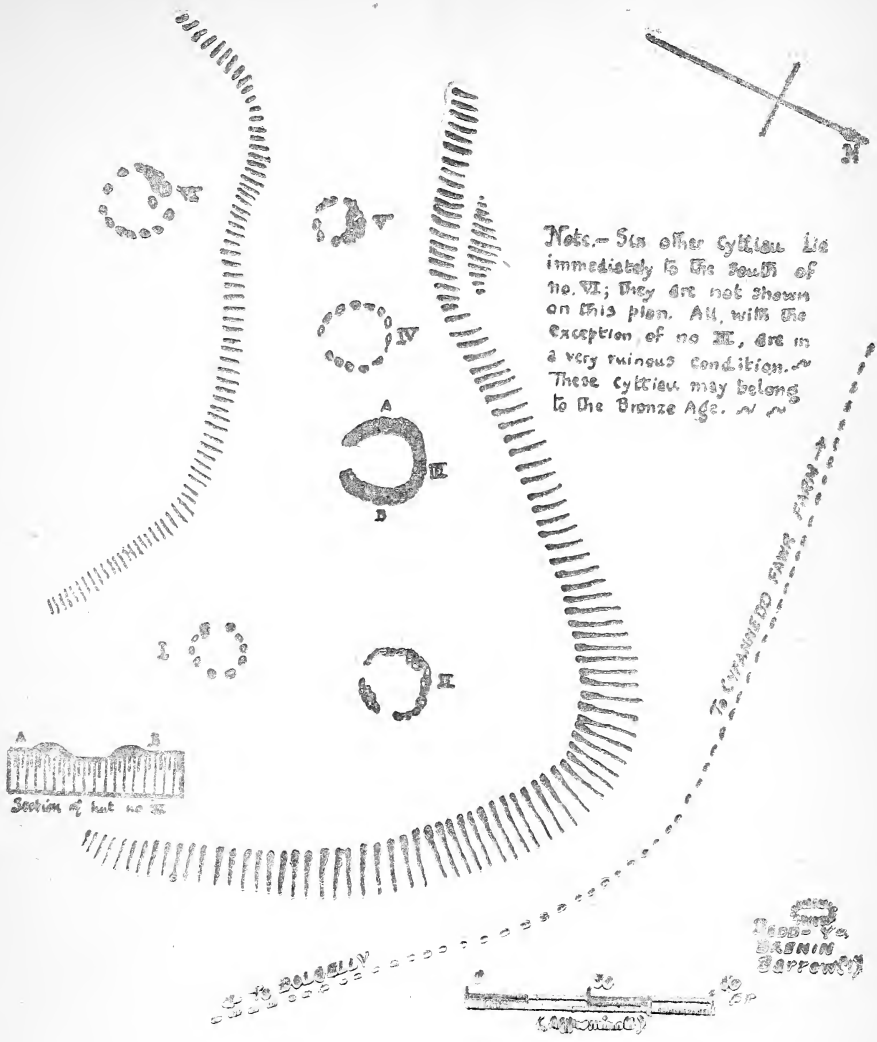
(*c*) Pit-villages. These consist of groups of hut-circles, usually earthen, some of which are double and even treble. I have seen groups containing 60 or 70 huts. They often occur in woods of the thorny acacia or ' umbrella tree ' (Acacia robusta), and the growth of the trees seems to indicate considerable age for the villages.

There can, I think, be little doubt that these smaller enclosures were actually dwelling-places. Similar constructions are found in large numbers in parts of Britain, which have been shown by excavation to be habitations; and when it is considered that to this day some tribes in eastern Africa live in similarly constructed places, it will appear that excavation is not necessary to convince us of this fact, but to throw light on the people who built them. It is probable that the circles were roofed with rafters and thatch. Distance from water at the present day is not necessarily a proof that they are not dwelling-places; for springs may have existed when they were inhabited that have now disappeared; and a great many circles are close to streams. These circles are, in general, easily distinguished from deserted Nandi bomas; in the latter the hollows are less pronounced, and the surrounding bank has the appearance of being formed by other methods than digging; the Nandi bomas become surrounded in course of time by a bank of earth and dung from the daily sweeping of the interior; modern Nandi pottery may generally be picked up on the surface, and the character of the vegetation differs from that on virgin or long-deserted ground, the following being some of the characteristic growth; solanum campylanthum, bidens pilosa, ricinus communis, nicotiana tabacum and a thick matted growth of couch-grass.

I add here, by way of comparison, a short description of such types of ancient dwelling-places in Britain as resemble the foregoing.

The two main forms in Britain are: 1. The pit-dwelling; 2. The hut-circle. (1) The pit is a fairly early form of habitation, and appears to have originated in the Neolithic Age; several groups of pits may be attributed to this era, as, for instance, the Hayes Common pits investigated by Mr. George Clinch. (R. Munro, Preh. Britain, 221, 222). The use of the pit, however, extended into the succeeding ages of Bronze and Iron, (Lord Avebury, Prehist. Times, ed. 7., 60), and even to Roman times in some localities, e.g., at Woodcutts Common in Cranbourne Chace, as storehouses (Ward, Rom.-Brit. Buildings, 186), and at Hod Hill, Dorset, as dwellings (Brit. Mus. Iron Age Guide, 123). These pit dwellings seldom if ever occur singly—as in this country they are generally in groups. As a good instance of a pit-village I may mention that Coles Pits, near little Coxwell, in Berkshire. Here, in a larch copse, are some 200 pits, varying in depth from 10-15 ft., and in diameter from 15-20 ft. (Lysons, Berkshire, 215; V.C.H. Berks; and personal observation). These may be of Neolithic date. Annexed is a typical section of one of the pits. The pits on Hayes Common referred to above, vary in diameter from 3-10 metres, and in depth from 15-90 cm., and are "surrounded by a well-defined mound" (Munro, l.c.); others are similar to these, but have "a low conical mound in the centre, supposed to be for a central pillar to support a roof." (ib.). The use of pits as dwellings was not confined to Britain. Tacitus says of the Germani—the locus classicus on this subject—"solent et subterraneos specus aperire, eosque multo insuper fimo onerant, suffugium hiemi et receptaculum frugibus: quia frigorem eiusmodi locus molliunt, et si quando hostis advenit, aperta populatur, abdita autem et defossa aut ignorantur aut ipso fallunt quod quaerenda sunt." (Germania, 16). The Masai at the present day cover the roofs of their huts with dung which is spread over a thatch fastened to a framework of poles (Hollis, Masai, 292). Some sort of framework must have been made in the Germanic huts to carry the plaster of dung. There is, however, reason to think that in some cases the pits were covered





G.H., Oct., 1915.

Fig. 5a. Plan of a group of hut-circles (Cyttiau Gwyddelod), near Cyfannedd fawr farm, Parish of Llanegryn, Merionethshire.

(For comparison with Figs. 5 and 8). [Royal Commission on Ancient Monuments . . . in Wales, Inventory, Co. Merioneth, No. 248.]

with thatch or turves. (2) Hut-circles. The use of dwellings with roughly built dry stone walls began in Britain in the Bronze or late Neolithic ages; and it is to the former period that many of the remains in Wales, known as " cyttiau gwyddelod " (Irishmen's or woodmen's huts) may be referred. A group of such circles, closely resembling local examples, and of a similar type, in the parish of Llanegryn, Co. Merioneth, is given in. fig 5a. (personal observation). In this group, the best preserved circle, No. 3, consists of a slight hollow surrounded by a ruined stone wall, similar to many in Nandi and Uasin-Gishu, and with an entrance on the south side. A particularly fine example, from the same county, is in the parish of Llandanwg, and has an excavation some ten feet deep, the sides being built up with dry stone walling; the diameter is 60 ft. Across the entrance are traces of a covering wall. (R. Comm. on Anc. Monts., Inv., Co. Merioneth, No. 120 and fig. 103). Similar covering walls occur elsewhere, e.g., at Grimspound (Munro, L.c., 218), and for this country, cf. figs 7 and 8. It is fairly clear that in Britain at any rate, the roofs of these circles were formed of rafters and a thatch of some kind. In some cases, stones presumed to be the resting-places of king-posts have been found in the centre; on Dartmoor, post holes have been found in the centre; and in the Glastonbury lake village, the stumps of oaken posts have been found in position. Strabo remarks that the huts of the Britons had high pointed roofs; while on the Antonine Column, huts are represented with thatched dome-like roofs.

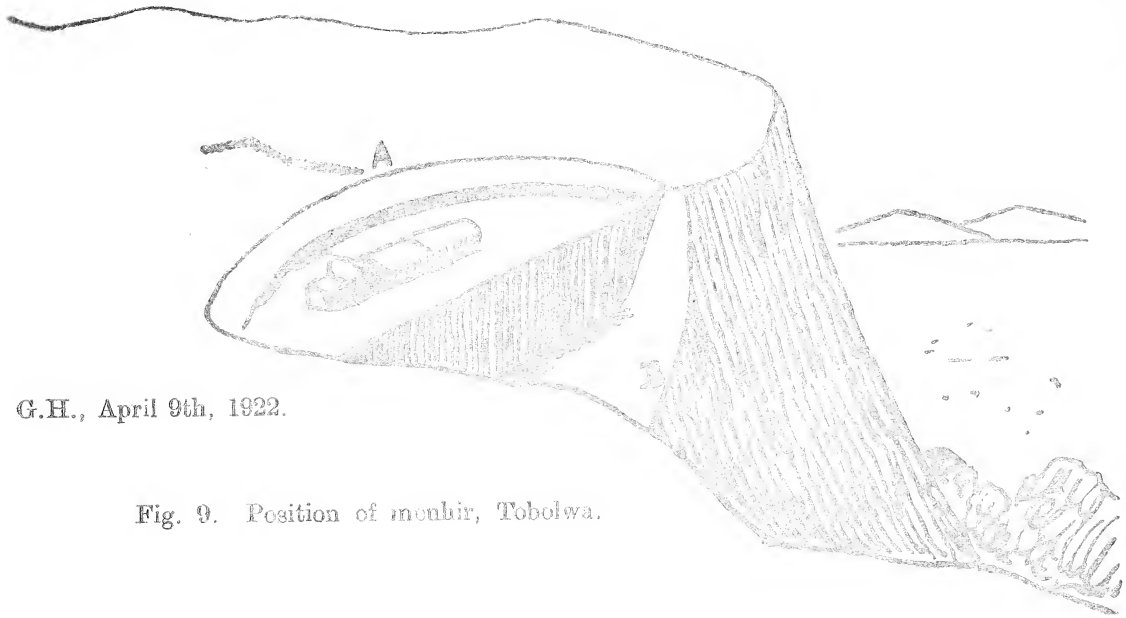
The foregoing remarks may seem to be out of place in connection with African archæology; but the remains in both countries are so similar that the one will probably throw some light on the other.

(2) Tumuli or Mounds.

It may be thought superfluous, in a region abounding in large ant hills, to search for artificial mounds; nevertheless, I have seen at least two mounds which have every appearance of man's handiwork. Both are near the Kipkaren in north Nandi. One is in the middle of a large pit village, and has a nearly rectangular flat top. Its dimensions are: circumference at base, 65 yards; length of east side, 15 yards; diameter at top, 8 yards; height, about 6 feet. On three sides are hollows from which the earth forming the mound seems to have been taken. It may be noted that a tumulus is not necessarily a burial mound; the one one just described may, from its position, have been intended for an observation post or watch tower.

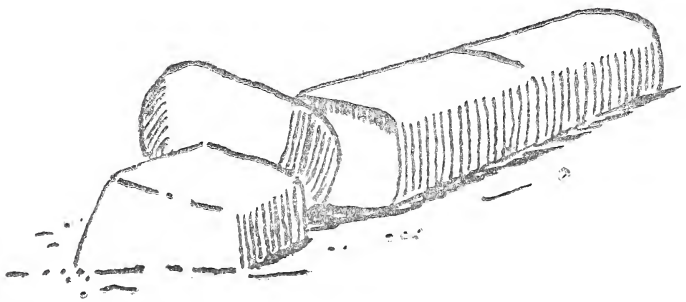
(3) Meini Hirion or Monoliths.

Of this class of antiquity, only one example is known in this area. It is on the summit of a hill in the western Nandi Escarpment, called



G.H., April 9th, 1922.

Fig. 9. Position of menhir, Tobolwa.



G.H., April 9th, 1922.

Fig 10. Menhir, Tobolwa.

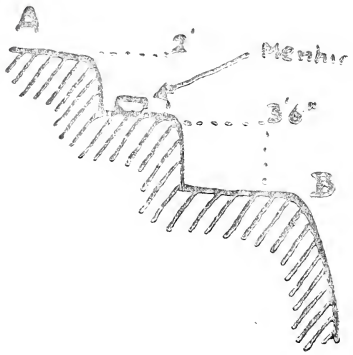
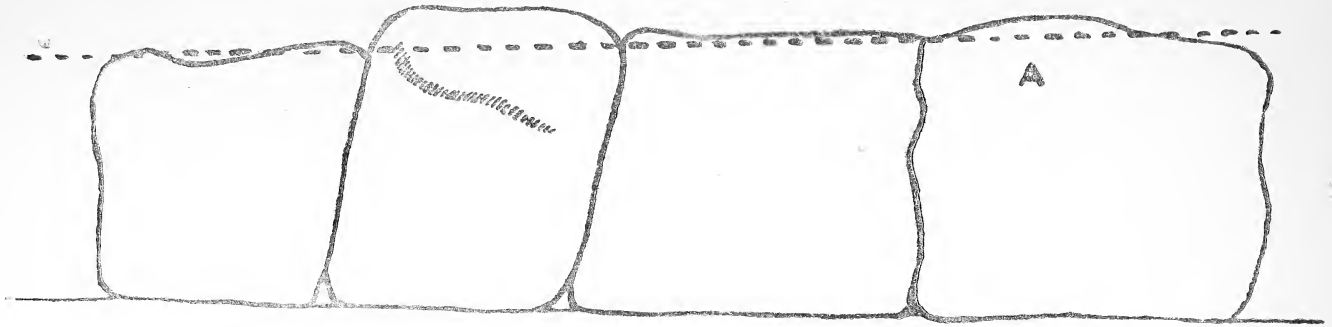
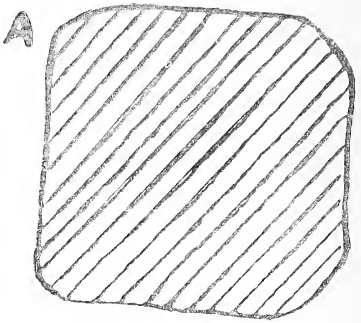


Fig. 11. Section on A—B, Fig. 10.



G.H., Feb. 24th, 1924.

Fig. 12. Diagram of Menhir, Tobolwa.



Cross-section at A.

[Scale as above].

Tobolwa by the Nandi. The summit is a huge mass of granite some 70 feet high, with a flat top measuring approximately 25 yards by 16 yards. On the northern edge, where the rock falls sheer for some 70 feet, it has been hewn into a sort of semi-circular seat 2 feet high, and about 20 feet in length. Inside this semi-circle, and lying on its side, is a roughly shaped block of granite, square in section, 10 feet long, now broken into three pieces. It tapers slightly, the breadth of the uppermost face being 36 inches at one end and 30 inches at the other. In the centre of the flat summit is a shallow depression where it may once have stood. Tobolwa is said to have been a local Nandi chief (kiruogindet) many years ago. The place is avoided by the Nandi; they say it is haunted, and that the lowing of cattle may be heard there at night.

(4) Roads.

In certain parts of the country, depressions have been observed on the slopes of ridges running in a straight line for some distance. These give the impression of being the lines of ancient roadways; they do not appear to be formed by natural causes, nor do they look like an amalgamation of old cattle tracks, for cattle tracks vary in width from a few feet to many feet, and the depth is irregular, while these depressions are of an uniform width and depth. A series of such 'roads' exists close to the confluence of the Kipkaren and Ain'-ap-setan rivers in north Nandi. On the right bank of the Kipkaren, a depression comes down the ridge almost to the river, and appears again on the opposite bank, where it runs up the ridge in a south-westerly direction, being plainly discernible for 300 or 400 yards. Another depression comes up from the south bank of the Ain'-ap-setan about 600 yards away, as if to meet it. The average width of these depressions is 8 feet, and their depth, 2 to feet; faint mounds are visible on either side.*

(5) Irrigation Canals.

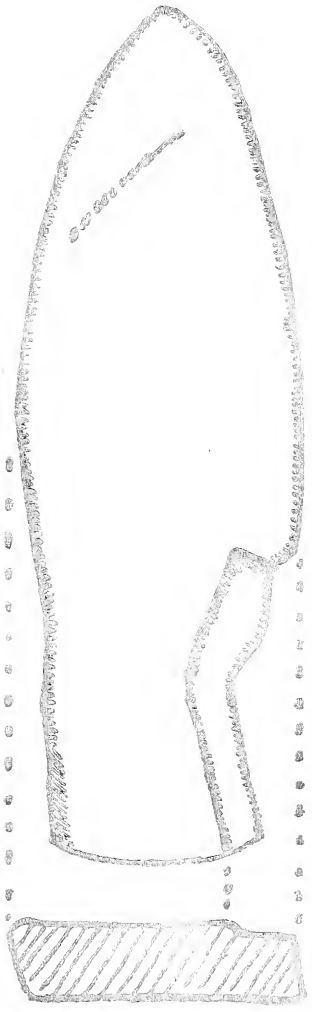
Mr. Hollis records that "there exist in Nandi the remains of irrigation canals, which, although of no great age, are the workmanship of other people [than the Nandi] . . . . It is possible that the canal were cut by the Sirikwa; but it is more likely that the work must be ascribed to a former Bantu occupation." (The Nandi, 2). These canals do not seem to occur in north Nandi; but I am told by Nandi that one may be seen near the Kipire (Pire on maps) river in central Nandi. It is, I think, impossible to ascribe them to the Sirikwa, for this people, by all accounts, never inhabited Nandi.

* Some of these have lately been ploughed over, and though still plainly to be seen, the side mounds are no longer visible.

i., [reduced]

ii., [$\frac{1}{4}$]

iii., [$\frac{1}{8}$]

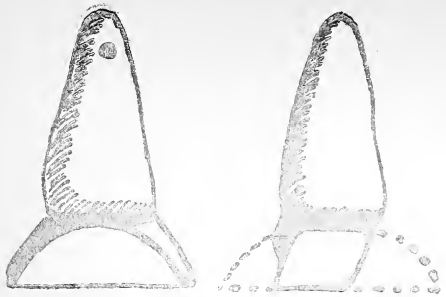


iv., [$\frac{1}{8}$]

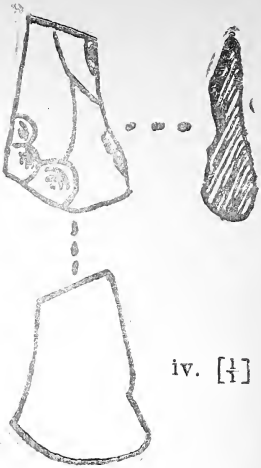
Fig. 13.

i., ii. Fragment of pottery, Moipen.
iii. Pre-Masai spearhead, Turbo Valley.
iv. Stone hoe, Moipen.

G.H.

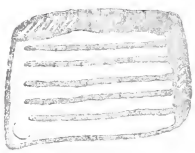


i., ii., iii. [all $\frac{1}{1}$]



iv. [$\frac{1}{1}$]

v. [$\frac{1}{1}$]

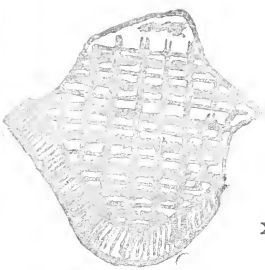


vi.

vii.

viii.

ix.



x.

vi., vii., viii., x., $\frac{1}{1}$
ix., $\frac{1}{2}$.

G.H.

Fig. 14.

i., ii., iii. Pointed object of stone, Moipen; iii., base.
iv., v. Obsidian flakes, right bank of Ain'-ap-Setan river, N. Nandi.
vi.—x. Fragments of pottery from hut-circle, left bank of R. Kipkaren.

(6) Graves.

It has been reported that "in some of the valleys [on the Uasin-Gishu plateau] there are rows of low ridges that suggest graves." Mr. C. W. Hobley informs me that, as far as he can remember, the supposed graves are somewhere to the north of the Ravine-Nandi track. It appears, however, from information from Mr. W. Mayes, of Lamu (kindly sent to me by Mr. A. Bailward), that this rport is founded only upon vague native rumours, and that there is no definite proof of their existence.

Finds.

The finds that have come under my notice are very few, though not without interest. Besides the pottery already described, I may mention the following objects:

(1) A small fragment of light brown earthenware vessel, found in digging the foundations of Col. C. E. Foster's house, Moipen. It has a true handle, a lump of clay pierced by a small round hole.

(2) A barbed spear-head found on Ollemasogai Farm near Turbo Valley. It is 7 inches long, the separate measurements being: length of blade, inches; of barb, one inch; of base or tang, 4 inches; thickness of blade, 13/16 of an inch. The point of the blade is broken, so that in its original state, it was probably an inch longer. The antiquity of this relic is shown by the base being a flat tang to be inserted into the shaft. (See Lord Avebury, Prehist. Times, 30). This example has no resemblance to any Masai or Nandi type.

(3) A hoe made of a flat slab of grey-green micaceous stone; length, 8½ inches; breadth, 3½ inches; thickness ¾ inch. It was found in a ruined hut-circle of Type No. 2 on Col Foster's farm, Moipen. The broader end is shaped to fit the hand; the other end has been worked to a point.

(4) Together with No. 1 was found a shall pointed object made of a green stone, 1⅜ inches high, with a flat circular base, which is scored with a series of parallel and V-shaped lines. It has been suggested that it was a lip ornament; but it is more likely to have been intended to be worn in the lobe of the ear.

(5) An implement of a stone resembling flint, of the 'coup-de-poing' type, and resembling early Palæolithic forms from Europe (particularly early Chellean forms), was found in the Masai Reserve near Narok, and was shown to me by Capt. C. S. Brereton, Headmaster of the Narok School.

(6) Flakes of obsidian, some seemingly worked, have been found in some parts. The AwaNyala (Kabaras) says that they fall from the

sky with the rain; as in England, neolithic axes and arrow-heads are said by the peasntry to have fallen from heaven, and which they call "thunderbolts," and "elf-shot."

THE BUILDERS OF THE RUINS.

We now come to the difficult problem of the authorship of the enclosures described above. Without excavation, it is, perhaps, of little use to theorize; nevertheless, a few suggestions may be made, which are not mere guesswork, but are based on a careful consideration of such sources as are available, viz., native traditions, place-names, and the evidence afforded by the habits of existing tribes.

A few words may first be said about the Sirikwa, a people whose importance has been somewhat exaggerated. There is no doubt that they are the people called il-Mukwan by the Uasin-Gishu Masai (hereafter referred to as Ipkôpek, their Kony name). They appear to have been a section of the Ipkôpek, who say that the il-Mukwan were driven out by them and fled to Tanganyika Territory, where their remnant still lives, called Sirikwa (Sirikwek) by the Nandi and the Kony of Elgon. The latter have a tradition that the Sirikwa were a section of the Ipkôpek; that the chief of the Ipkôpek joined with the Chief of the Kony and they made a powerful medicine with which they began to kill off the Sirikwa; and that the Sirikwa fled to Tanganyika Territory, where they still live. They say also that this chief of the Kony was the father of Kieptek, one of their present chiefs, who was a very old man when he died; this exodus of the Sirikwa must, therefore, have taken place before 1850. The union of the Ipkôpek and Kony chiefs is rather curious; but at the present day, the Kony have a considerable admixture of Ipkôpek blood, and their relationship in the past must at times have been friendly. The Ipkôpek say that the Sirikwa were originally not of the same race as themselves, and that they settled with them, and in the course of time lost their own language. The Ipkôpek say also that the ruins on the plateau were the work of the Sirikwa, and they account for the hollow floors by saying that the Sirikwa were very tall people, and that when the floors were level, there was not room for them to lie at full length, so that they hollowed the floors and lay with their feet and heads against the walls and their backs in the hollows. This points to the Sirikwa having found the circles built when they came, rather than to their having built them.

Both Nandi and Ipkôpek say that the Sirikwa never came into the Nandi country, which still retains its ancient eastern and western boundaris, though the northern and southern limits have been altered. Therefore, the Sirikwa cannot have built the ruins in Nandi and Lumbwa, of which the former has been occupied by its present

holders for at least 250-200 years, and perhaps longer; and the latter for a much greater length of time. It may be said, that perhaps the Sirikwa were on the plateau before the Ipkôpek or Nandi; to which the answer is that (1) we have only the word of the Ipkôpek for the non-Masai origin of the Sirikwa, supposing that their tradition has been reported correctly—and I have only heard it at third hand; (2) the traditions of the Nandi concerning the remote past know only of the Okiek (Dorobo); (3) the Masai living near Ikoma in Tanganyika Territory are called ' Sirikwa ' by the Nandi and Kony to this day. The Mbulu and other tribes of the Tanganyika highlands live in pit-dwellings; and it is possible, as Mr. Hobley has suggested, that they represent the remains of tribes driven out of the Nandi and Ipkôpek areas by the Nandi and Ipkôpek.

The Keyu (Elgeyo) say that the builders of the ruins were a ' red ' people who came from beyond Mount Elgon a very long time ago; and some even say that they were ' Europeans.' This tradition may have a basis in fact. It may point to a race of Libyan origin.

It has been suggested that there is a connection between these ruins and those in Rhodesia. But between the rough primitive stone walls in this country and the well-built, neatly coursed structures at Zimbabwe and Inyanga there is little resemblance, except that both are made of stone. It is possible that our ruins represent the earlier work of the Zimbabwe race; but even if we accept this, we are no nearer a solution of the problem. Conjecture and research have been busy for many years in Rhodesia, but no final decision has yet been made—witness the conflicting opinions of the late Mr. R. N. Hall, who, in his ' Prehistoric Rhodesia,' concludes that the ruins are of ancient date, and due to Semitic immigrants; and of Dr. D. R. MacIver, who holds that they are the work of a native race in comparatively modern times. (' Mediæval Rhodesia.').

In conclusion, I think it is not unreasonable to say that the ruins in this country are the work of a race which was driven out by the Masai and Nandi, and which has either become totally extinct, or been merged in other tribes; and that it came originally from the north, and not from the south.

NOTES ON SUN-WORSHIP AMONGST THE KIPSIKIS OR LUMBWA TRIBE.

By C. E. Ward.

Sun-worship is practised among the Kipsikis tribe and is one of the most important festivals and is celebrated annually in the month of May.

First of all the people are warned that the following day those having beer should bring it to the hut of the Master of the ceremonies, who is an elder and his Office is hereditary. When they have brought it they are then told that the beer will be ready on the third day and trumpets will be blown.

At 6 a.m. the trumpets are blown and the people prepare to proceed to the place of the ceremony which is called " Kapkorosit " on account of the large bundle of sticks bound together which has been set up on the site.

Then 8 small girls (uncircumcised) bring goats' dung in their hands and place it near the bundle of branches—then the 8 small girls, whose task it is to bring water, take the dung and build a circular wall about 5 inches high and 3 feet in diameter. The Elder's wife now brings a white he-goat which is adorned with a leather collar covered with cowrie-shells, also the whole of his skin is covered with " Senendet " grass. The elder now takes a gourd from 4 of the 8 little girls into which the milk of a goat, a sheep and a cow, each of which have borne once only has been milked; the elder then poors an equal portion from the 3 gourds into the fourth which contains water. The space enclosed by the goats' dung wall is called " Togomda " because what is placed inside it cannot get out.

The elder brings a gourd of tembo and pours it into the enclosure and the contents of the 4 gourds of milk and water also the contents of the four gourds full of water brought by the remaining 4 of the original 8 girls.

The preparation being now completed, the elder, with another of like age, retires about 6 paces to 2 separate poles placed about 4 feet apart each with a cow's tail in his hand. The onlookers who are behind the 2 poles may now enter headed by the elder's wife with the caparisoned goat; they incline half right and proceed to encirlce the " Togomada." A fire has been lighted near the Kapkorosit pole. The two elders leave their places at the portal and advance to the top of the " Togomda " and stand between it and the people, dip

their cows' tails in the milk, water and beer and sprinkle the people with the mixture; the goat during this is led round the " Togomda."

During the sprinkling of the people each elder says, addressing the sun: " I am now giving you milk—do you give us children—cattle, wimbi and good grazing."

Everyone during this is facing the rising sun, which is now at about 7 a.m., and responds " soi," meaning " thanks," proleptically.

After the sprinkling of the people, they leave their positions, encircle the Togomda, pass between the two posts, turn about and face the rising sun and finally disperse.

The elder having adjured all married men present not to quarrel with their wives nor to have connection with them that day.

The adult males and old women next proceed to the elder's hut to drink beer. He first covers over with grass, which has been pulled up by the roots, all the vessels containing the beer—then they begin to drink and continue to do so until the beer is finished, the beer being diluted with hot water whenever necessary—and having drunk his fill each goes home.

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CONTENTS.

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The Journal
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THE BIRDS OF KENYA AND UGANDA.

Part III.

Family.—PHASIANIDAE, contd.

Genus.—**FRANCOLINUS.**

Francolins or "African Partridges."

Game birds of the Genus *Francolinus*, (sensu lato) are well represented within the boundaries dealt with in this paper, but nevertheless detailed knowledge of their systematic status or even of their habits is sadly wanting. Attention of members was drawn in a foot note to page 108 of Journal 23, to the great need for augmenting the Museum series of "game birds" from type localities and surrounding districts; this need is especially acute with regard to Francolins. Perusal of these pages will shew that without such specimens it is difficult to follow out the various geographical forms or races which have been described.

Francolinus (Peliperdix) lathami schubotzi, Reichw. Uganda Yellow legged Forest Francolin.

Ref. Reichw. J.f.O. 1912, p. 320.
Type locality, Welle River, Belgian Congo.

Distribution: Forests of Uganda, from Lake Albert to Mabira,

Description:

General colour, chestnut above, black with white spots below. Crown olive grey, shading to grey on the forehead. Supercilium greyish in front and white behind; a black streak passes through the eye from the base of the nostrils to above the ear-coverts. Cheeks, side of head and ear-coverts white, tinged with pearly grey. Nape to upper part of mantle olive-brown, with white shaft streaks outlined with black. Lower mantle, scapulars, and coverts bright chestnut brown each feather more olive towards the centre, and with a distinct white shaft-streak accentuated by black edges. Lower back, rump and upper tail-coverts olive-brown with more brownish edges, finely vermiculated with lighter brown. Primaries and secondaries blackish-brown, the latter with pale brownish edges and vermiculations.

Rectrices olive brown with lighter brown vermiculations, the outer three pairs with pale tips. Chin and throat jet black. Side of neck,

chest and breast, black, each feather with a cordate white spot towards the end. Flanks brownish with distinct white shaft-streaks outlined in black. Belly whitish with indistinct greyish or buffy bars. Under tail-coverts black with white shaft-spots and streaks, and slight barring. Bill blackish, legs yellow cadmium. Wings 141-150 mm.

Juvenile, Male:

Somewhat like the adult but blackish brown on the crown, richer darker chestnut on the mantle and inner coverts with less definite white shafts, but more marbling and in addition with large black marks at the ends and on the inner webs, giving to the back a mottled appearance. The cheeks are brownish; the throat buffy white, and the breast brownish with white angular spots. The feathers of the flanks are vermiculated.

Juvenile, Female:

Resembles the adult but has the throat and underside whitish.

Female, Adult:

The female differs considerably from the male. Crown olive brown; a buff supercilium extends from the nostrils to the ear-coverts and meets its fellow of the opposite side, thus encircling the crown. A black streak passes through the eye from the lores to the ear-coverts and nape and extends down the neck in a widening line. The cheeks, ear-coverts and centre of side of neck are dull chestnut. Lower neck and upper breast olive brown, each feather with a narrow white shaft streak. Mantle, smaller scapulars, rump and upper tail-coverts olive brown with buff shaft-streaks and close blackish vermiculations. The scapulars and inner secondaries are darker with buffy brown bars and vermiculation, the latter, along with the coverts are ornamented with large black blotches mostly on the inner webs. Primaries and secondaries blackish brown, the latter with pale buff vermiculations on the edge of the outer webs. Breast and flanks olive brown with large white cordate spots, these spots being elongated in the latter area. Abdomen and underside whitish with blackish bands. Bill black; Legs cadmium yellow.

Habits:

Little is known regarding the habits of these birds. They are entirely forest dwellers and as such are seldom met with . There was no record of their occurence in Uganda prior to my collectors obtaining specimens in 1913. They are shy and timid and keep for the most part to the densest forests; their powers of flight are therefore restricted, but their agility as runners is proportionately increased. These birds are usually found in pairs or small coveys composed of

a family party. I have not heard them calling, but they utter a low whistling note when feeding.

Good native hunting dogs are indispensible when one is searching for these birds; they will follow up a scent and round up the birds, and if well trained they will make them bunch; it is then a matter of practise to come up with them. Hunting these Francolin requires patience and not a little skill. One enters a thick patch of forest and crawling quietly along one sits down preferably against the trunk of a large tree; ears and eyes alert to the slightest sound and movement. Very frequently the only indication which one has of the birds' presence is, a faint rustling of leaves as they scratch amongst the fallen debris, or the low note previously referred to. Stalking birds in a Uganda forest is no joke; ants and other crawly creatures abound and that well-named pestilential fly *Simulium damnosum* plays havoc with any area of one's skin they can get at; lumps and bumps and acute irritation of one's epidermis and also one's temper, must be borne with the patience of Job if the Francolins are to be seen, let alone obtained.

Breeding apparently takes place in May and June and also in January but the actual " season " is not defined. The nest is merely a depression in the ground at the base of a tree or under a dense bush; little or no lining is added. The eggs are red-brown to rusty brownish, rather pointed at one end.

Young in first feather were collected in September.

Francolinus (Pelliperdix) nahani, Dub. Uganda Red-legged Forest Francolin.
Ref. Dubois, Ann. Mus. Congo I. 1905, p. 17.
Type locality, Ituri River, Congo.

Distribution: Forests of Uganda from Chagwe to Lake Albert and Edward.

DESCRIPTION:

General colour brownish above, black and white below.

Crown with elongate dark brownish black feathers, longest at the nape. Posterior part of supercilium black and white. Ear-coverts brownish. Cheeks, side of the neck and most of the throat with small pear-shaped black spots. Lower neck and chest black with sparse white spots on margins of the feathers. Breast and flanks dull black, each feather with broad white margins which gradually become broken into spots on the flanks. Abdomen and thighs dull

greyish black with ill-defined white bars. Under tail-coverts glossy black with a few buff spots and bars. Mantle, scapulars, rump and upper tail-coverts olive brown, with black vermiculations, large black sub-terminal spots with a buff shaft streak at the apex. Wing-coverts brown with black vermiculations and a buff spot towards the extremity of the outer web. Secondaries black with irregular transverse pale brown markings; primaries blackish brown with pale brown edgings to the outer web. Tail black with brown vermiculations.

Bare patch round the eye crimson, base of bill crimson, tip black-brown. Legs and feet crimson; no spurs. Wings 137-155 mm.

The sexes are almost alike, the female is slightly more brownish on the chest and is smaller.

The immature bird is heavily mottled on the dorsum and is brownish with white mottling on the underside.

Habits:

Very little is known regarding the habits of this species. They are found only in the large forests and being extremely shy and very cryptic in colouration they are easily missed.

They associate with the Blue-spotted Forest Guinea-Fowl and when first seen thus, they were mistaken for young of that species; In the half light of the forest they are difficult to distinguish, especially so when one catches no more than a momentary glimpse of them. They feed largely on the small moluscs which one finds in decaying vegetation; on other insects, on green shoots and seeds of various plants and on bulbs. We have not taken their eggs nor are there any published records regarding them.

Francolinus (Ortygornis) coqui coqui, Smth. Coast Golden-headed Francolin.

Ref. Smith, Rep. Exped. Centrl. Afr. 1836, p. 55.
Type locality, Kurrichaine.

Distribution: The coastal belt of Kenya from the Tana to Vanga and inland to Samburu and the Taru Desert.

Description: Male, Adult.

General colour brownish grey above, barred below; head golden. Top of head chestnut, the posterior feathers with darker centres. Ear-coverts chestnut; lores, supercilia, cheeks, nape and side of neck bright golden buff. Chin and throat whitish buff, outlined at junction with upper chest with golden. Sides of chest and posterior neck-band

black and white. The whole of the underside from chest to vent, buff, heavily banded with black; many of the flank feathers tinged with chestnut. Under tail-coverts richer buff, black banded. Feathers of the mantle, scapulars and inner secondaries alternately banded with buff and black with a grey tinge especially on the outer web and tip and with a chestnut wash on the inner web. The shaft-streaks distinct, of a buff colour outlined in black. Primaries and secondaries greyish black, the latter with ochreous bands accentuated with black edging. Tail rufous buff banded irregularly with greyish-brown and blackish.

Bill horn-brown with blackish tip and yellow base to lower mandible. Legs and feet yellow orchre.

FEMALE, ADULT:

Very like the male but with more greyish on the back; paler golden on the head; with an interrupted line of black commencing at the lores, passing under the eye and ear-coverts and curving round to the side of the neck and meeting a corresponding line from the other side thus entirely enclosing the buffy white area of the throat. A second but ill-defined line breaks up the buff supercilium and extends a little more than half way down the neck. Upper mantle and chest, pale chestnut, strongly tinged with grey, each feather with a narrow buff shaft sometimes accentuated with a blackish streak half way along. In other respects the sexes agree.

IMMATURE:

Young males resemble the female but are much more banded and mottled above, rather more rufescent; and with the barring on the undersurface rather broken into irregular spots.

HABITS:

The "Coqui" Francolin or 'Swempi' of the Dutch, is an inhabitant of the more open tracts of grass and country where low scrub and scattered thorn-bush is found. It is still plentiful in the districts around Mnngeya and in the Shimba hills and in the grass country round Samburu, but it is diminishing in numbers owing to the activities of native trappers.

They are sometimes found in the patches of native cultivation on the hillsides. Unless deliberately looked for they are seldom seen, but their distinctive call is one of the familiar sounds in the hillsides they inhabit. They call at dusk and in the early morning just at daybreak, two or more birds joining in a chorus of Qui-kit qui-kit, not particularly loud but of penetrating quality which carries a long way. Males do most of the calling, but I have heard females answering.

These birds are usually found in small coveys of four to six; are quick on the wing and give excellent sport. They can be flushed two or three times if carefully marked down, but they soon tire and will then gather run and go to cover. On one occasion after walking up a covey three times I marked the spot where they last dropped and coming up to the place searched the thickest bushes of grass in the vicinity and captured four birds alive!

They do well in captivity and make excellent ground birds for an aviary. The cocks are pugnacious and have to be kept apart.

Coquqi Francolin go to nest twice a year, but I have no exact records as to the duration of the seasons. Eggs have been observed in May and December and young in first feather in February, May, June and August. The nest is a slight hollow under a tuft of grass. Six to eight eggs have been recorded as the clutch, creamy-white in colour, rather round with a slight taper at one end.

Two races of the Coqui Francolin are recognisable and are detailed below.

Francolinus (Ortygornis) coqui ruahdae, Subsp. nov. Ankole Golden-headed Francolin.
Ref. Praed, Ibis, 1922, p. 108.
Type locality, Ankole, Uganda.

Distribution: South-western Uganda.

DESCRIPTION:

Additional material to that recorded in Nov. Zool. Vol. XXIX., 1922, p. 30, shows the Ankole race to be constantly rufous above, and recognisable as a geographical form.

MALE, ADULT:

Very like *coqui coqui*, but more richly coloured above. Crown and nape chestnut with darker centres and greyish tips. Lores supercilia, shin and sides of neck golden. Ear-coverts brownish; throat white. Feathers of mantle with wide white bars and narrow black bands, with rich chestnut tinge to the inner webs.

Scapulars, back, coverts and secondaries as in the typical form but lacking the greyish tinge and being more rufescent; with wider and more distinctly marked shaft streaks. Flanks with more chestnut. Otherwise rest of plumage as in typical race.

FEMALE, ADULT:

Differs from the typical race as above.

Habits:
As for typical form.

Francolinus (Ortygornis) coqui hubbardi, Og-Grant Hubbard's Golden-headed Francolin.
Ref. Og-Grant, B.B.O.C., IV., 1893, p. 27.
Type locality, Nassa, Victoria Nyanza.

Distribution: From South Victoria Nyanza to Naivasha; and Magadi and east to Ravine and Baringo and recorded from Machakos and Fort Hall.

Description: Male, Adult.

Feathers of crown dark brown with pale tips. Nape and ear-coverts chestnut, the former blackish speckling. Lores, supercilia, cheeks and remainder of head and neck, golden buff. Lower neck and upper breast buffy white with pronounced black bands. Sides of chest greyish with buff and black bars. Rest of underside pale sandy-buff deepening in shade on the under tail-coverts and barred on the flanks; some examples are tinged with rufous in this area.

Feathers of mantle, scapulars, back and rump, wing and tail-coverts greyish-brown with buff shaft-streaks and cross-bars, the bars of the inner webs shaded with black. Tail feathers except for the central ones rich chestnut with black irregular bars and buffy tips. Central pair greyish-brown with buff wavy bars outlined with black.

Bill horn-brown; base and gape yellowish, lower mandible yellow. Legs and feet yellowish. Wings 137-140 mm.

Young males resemble the female somewhat, but the head markings are not so distinct.

Female, Adult:

Resembles the male but is paler buff on the throat and awlays has a black line outlining this area; a second black line, more interrupted, commences above and in front of the eye, passes through the supercilium downwards along the side of the neck where it widens and breaks up. The breast is greyish, with buffy barring and white and very narrow shaft-streaks, each streak ending in a buff spot, and most outlined in black. Underside like the male but with more numerous angled bars and with greyish buff on the flanks.

Habits:

This Francolin is found in small coveys of three to four brace frequenting the grass and open country. It is a particularly difficult bird to find as it lies close and is most difficult to flush. Even when come upon suddenly, they refuse to rise but will slink off as close to the ground as possible towards the nearest cover. Their call is deceptive for they at times alter the volume in such a way that the sound may first appear near at hand then quite in the distance. One hears them most frequently in the early morning and in the evening when the sun is well down toward the horizon. The call is an oft-repeated "Kwee-i-kit." These birds used to be quite plentiful in the Nakuru and Elmenteita districts but their numbers have been terribly reduced.

Throughout practically the whole of their range, these birds go to nest during May and July, and October to December, but, as with other Francolin, there is really no hard and fast breeding season, the nesting time is influenced to such an extent by the period of the rains.

Young in first feather and others half grown have been taken in July and October. The nest is a slight hollow under a small bush or a tuft of grass, sparsely lined with grass and bits of leaves. The eggs are a dirty white to buff in colour, measuring 30 x 35 mm. The clutch consists of six to eight eggs. There are no records as to the incubation period.

I have on occasion flushed Hubbard's Francolin from the edge of maize fields and from flax, but do not consider that they do a great deal of damage to either crop. Dissection of the crops shews that the quantity of seed taken is negligible. The food consists largely of insects, larvæ of various sorts, beetles, etc., grass seeds, bulbs, rootlets and molluscs.

Francolinus (Dendroperdix) sephaena grantl, Hartl. Grant's Red-legged Bush Francolin.
Ref. Hartl. P.Z.S. 1863, p. 665.
Type locality, Unyamwezi, Tanganyika Territory.

Distribution: Uganda, and Kenya except the country north of the Northern Guasso Nyiro, and the Coast Belt north of the Tana River.

With this race is temporarily united *F. s. delutescens.* Mearns, type locality, base Mt. Kenya. S. M. Coll. 1911, No. 20, p. 3.

The geographical forms of the " sephæna " group of Francolins present great difficulties. It would appear that this wide-spread species is in process of evolution into certain defined races, but these forms are not yet sufficiently advanced for purposes of clear definition of distribution.*

In the present state of our knowledge we must treat the birds inhabiting the area as indicated above as belonging to the race '*granti.*'

DESCRIPTION: MALE, ADULT.

Top of head blackish brown, with paler edges and greyish tips. Margin of crown blackish especially at nape. Lores and supercilia creamy white; a black line passes through the eye from about the centre of the lores to the upper edge of the ear-coverts. Ear-coverts creamy with brown streaks. Cheeks, side of neck, lower throat, white with triangular chestnut spots. Throat and chin creamy white. Upper chest buff, with paler centres and triangular chestnut spots and olive vermiculations to each feather. Chest and flanks buff with paler shaft streaks and olive wash and pencillings especially on the flanks. Sides of abdomen and vent richer buff, inclining to rufescent on the under tail-coverts.

Feathers of mantle, scapulars, and wing-coverts chestnut inclining to greyish along the shafts, with a pronounced white or creamy shaft-streak accentuated by black outlines. Primaries and secondaries dark greyish brown with white shafts, the latter with paler edges. The innermost secondaries and longest scapulars with dark chestnut patches on the inner webs. Rump and upper tail-coverts greyish olive brown with indistinct vermiculations. Rectrices, except central pairs dark brown inclining to black at the ends. Central pairs olive brownish with paler edges and slight vermiculations. Bill brownish black, paler at gape and at base of lower mandible. Feet rosy red. Wings 140-148 mm.

FEMALE, ADULT:

Somewhat like the male but smaller; much more freckled below and strongly vermiculated above on a darker chestnut brown ground colour. Rump and upper tail-coverts and central rectices more strongly vermiculated. Wings 130-145 mm.

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*With the exception of Duck, I suppose that Francolin are more often shot than any other species of bird, yet the material preserved is far too small to be taken as conclusive evidence regarding many of the described races. I would appeal to sportsmen to preserve the skins of every Francolin they shoot and send them to the Museum with data as to where and when obtained.

JUVENILE:

The chick in down is pale sandy buff below, paler on the throat and abdomen; more yellowish on the back and with a chestnut brown central line outlined with blackish, and a lateral marginal line extending from the scapular region to the line of the pelvis. Centre of crown chestnut widely margined with buff.

In first feather, the crown is dark brown with buff supercilia; from chin to vent pale buff, with slight vermiculations on the chest and flanks. The back is ornamented with distinct wide buff shaft-streaks, brownish as on the inner webs and marked blackish vermiculations.

The chestnut spotting on the lower throat and breast is not indicated until the next feathered stage, at which sex colouration is indicated.

The habits of the various races will be dealt with as a whole.

Of the various races described the following are admissible:—

Francolinus (Dendroperdix) sephaena jubaensis, Zedlitz. Juba Red-legged Scrub Francolin.
Ref. Zedlitz, O.M., 1913, p. 59.
Type locality, Afgoi, South Somaliland

Distribution: Jubaland, especially south-east to just north of the Tana River.

DESCRIPTION:

This is a smaller and generally paler race than *F. s. granti*, with no striping on the underside.

Wings 130-140 mm. The scheme of colouration is otherwise similar.

Francolinus (Dendroperdix) sephaena subsp, Ref. Praed, Ibis, 1922, p. 112. 5f.

Distribution: Northern Guasso Nyiro, north-west to South Rudolf.

DESCRIPTION:

A rather pale form which is not very stable, influenced by two races which encroach on its boundaries. There is no striping on the breast.

Francolinus (Dendroperdix) sephaena subsp, Ref. Praed, Ibis, 1922, p. 112 5g.

Distribution: Northern Tanaland from the Lorian to Moyale, boundary of Southern Abyssinia, eat to Dolo, and northern part of Jubaland.

Description:

A large form with rather pale underside which is usually ornamented with narrow chestnut streaks on the breast and flanks, these marks being continuous with the spotting of the neck. In addition there is a greyness on the back not seen in the form *granti*. Wings, 140-160 av. 156.

Francolinus (Dendroperdix) sephaena rovuma, Gray. Chestnut-spotted Bush Francolin.

Ref. Gray. List. Gall. Brit. Mus. 1867, 6. 52.

Type locality, Rovuma River, T.T.

Distribution: Enters the southern boundary of Kenya at Vanga; has also been recorded from the Taru and Teita country.

Description: Male, Adult.

Somewhat like *granti* but with more chestnut mottling on the side of the neck; more blackish at apex; with distinct long chestnut spots at the ends of the feathers of the breast, belly and flanks. The back is very dark, with black patches and barring well defined. Rump and upper tail coverts, distinctly barred. Under tail-coverts barred.

Female, Adult:

Very like the male but much more mottled and barred above, from the mantle to the rectrices.

Habits of Group:

These Francolin are essentially birds of the thorn-bush country as can be ascertained by studying their distribution. They are not found in the high country or forest zones. The coveys are usually small even when composed of parents and young; on no occasion have I seen more than eight birds together. Though inhabiting the somewhat dry bush-country they much prefer the vicinity of water either temporary or permanent. Their distinctive call is one of the familiar sounds of dawning day. As the first rays of sun shew up against the horizon, these birds begin to stir, first here and then there the males will mount their favourite "calling stance" and throw out a challenge to the wide world. The call has a quality of defiance and recklessness in it, and is uttered with complete abandon. It is quite a ludicrous sight to watch a male shouting his challenge in reply to another perhaps a quarter of a mile away. With tail raised and crest erected he shouts first in one direction then another, all the while with body held erect and feathers of rump spread out. The evening call is indulged in but there is a lack of vigour about it. Their call

can be likened to the syllables Kar-i-reek-kik, repeated several times in succession. They also utter a low note like kee-rik, when they feed or are having a sand bath. These birds know when a rain storm is working up and become restless; the males call and run around excitedly. Jackson has recorded the fact that he has heard Grant's Francolin calling on a moonlight night.

During the heat of the day they lie up under the shade of a bush and rest; if disturbed thus they squat and refuse to rise unless pressed too closely. One has heard this bird referred to as being unsporting, as they seldom give one a chance of a shot, but for this very reason I consider them good sport. It is the quick and accurate shot who succeeds in getting his bird just in time, before it swings behind a bush or nose-dives into the base of the nearest cover. It is true that one cannot often walk these birds up without the aid of a good dog, but the mere fact that the chances the bird gives are few, adds, to my mind, a far greater opportunity for real skill as a snap-shooter, than any other francolin shooting I know of. Without a dog, these birds may be flushed once, perhaps twice, but not oftener.

There are certainly two principal nesting seasons which coincide roughly with the rains, but eggs or very young birds have been recorded throughout almost every month of the year; thus my records shew that eggs have been noted in March and July and in December and January, while young in first dress, in February to August and January. The nest is a slight depression with practically no lining and is usually situated under a small bush or in thick grass. Six to eight eggs are laid, cream coloured or white, with pores only slightly indicated, or they may be buff with brownish pores. The shell is very thick and extremely hard. In shape they are oval with slight tapering at one end. Average size 29 x 37 mm.

The chicks are able to fly as soon as the wing feathers come in, and this comes about very rapidly. The young run with their parents until they are quite full grown. Most of the food is found by scratching, and consists of seeds, roots, insects and snails, but they are also partial to green food such as grass shoots and young leaves.

These birds do well in captivity and breed readily if kept in suitable enclosures and fed properly. They require quite a lot of insect food, such as white-ants and grasshoppers.

Francolinus (Scleropila) streptophorus, Og-Grant. Nzoia Francolin.
Ref. Og-Grant Ibis 1891, p. 126.
Type locality, Mangiki's Boma, S. Elgon.

Distribution: Elgon and Kavirondo, to Fort Ternan; Unyoro.

DESCRIPTION:

Crown umber-brown outlined laterally by a white supercilia; lores, cheeks and earcoverts, bright chestnut, with a white streak from below the eye through the base of the ear-coverts. Chin and throat white; sides of neck and nape buffy, with triangular chestnut spots at tips of each feather. A wide collar of white black-banded feathers encircles the lower neck and upper breast.

Lower chest, abdomen and flanks, buffy, slightly banded in the first area and somewhat vermiculated in the last; the flank feathers have in addition distinct buff shaft stripes and black areas on one or both webs. Mantle scapulars and wing-coverts umber-brown, most of the feathers with buffy shaft-streaks and dark patches of blackish, shading to chestnut, on either or both webs. Rump umber-brown with dark centres; upper tail-coverts more rufescent; rectrices, primaries and most secondaries dark brown.

Bill horn-brown; legs dull yellow. Wings 152-164.

FEMALE:

Very like the male, but is rather more banded on the mantle, rump and tail-coverts. The wing-coverts have buff spots in addition to the pale shaft streak.

I have no personal knowledge of the young of this species neither is there any published description of them.

HABITS:

This Francolin inhabits the rough broken hillsides so common along the Maragoli Escarpment, and in north Kavirondo. Grass lands do not appeal to it, but where the ground is rough and vegetation is poor there one may come upon these birds in coveys of four to six. They are extremely shy and wary and skulk amongst the sparse cover to avoid detection. They are loath to take flight and lie so close that one almost comes atop of them before they get up with a whir and cackle. They never fly high, and invariably make for cover, so that it is difficult to get a shot in at a reasonable distance. If by chance they happen to be in more open country or grass, then one can get quite good shooting.

Like other Francolin this species has two periods at which it calls, early morning and at sun set. The note is a rather peculiar one somewhat like the low plaintive call of a Guinea-Fowl, not the loud rattling call but that indulged in when courting, like the syllables Ki-ki-kee, ki-ki-ki.

The only nest that I have seen of this species was placed at the foot of a slightly overhanging rock; little or no attempt had been made to line the shallow depression which contained four eggs of a greyish-buff colour with pores slightly darker in shade.

Little has ever been recorded about this bird which is certainly not common. Claude Grant has recently taken the species in Tanganyika Territory, but its exact distribution has by no means been clearly defined.

Francolinus (Scleroptila) africanus uluensis, Og-Grant. Ulu Grey-winged Francolin.
Ref. Og-Grant, Ibis, 1892, p. 44.
Type locality, Lulu, Ukambani.

Distribution: Through the thorn-bush and grass-country from Kilimanjaro, to Kisii, and east through Ukamba to N.E. Kenia.

Description: Male, Adult.

Crown blackish edged with a pale brown. The supercilia, lores and cheeks are rufous; the superciliary stripes pass down the sides of the neck and meet behind at the hind neck, while the rufous of the cheeks extends downwards and encircles the buffy white of the throat. Both these lines are bordered on the lower or front edge by a broken line composed of a series of black tipped feathers. The rufous areas on the sides and on the hind neck, are separated by a white patch heavily speckled with black. The marginal feathers of the throat are black-tipped. Mantle, scapulars, wing-coverts, rump and tail-coverts grey with distinct buff shaft-streaks, widely spaced buff or rufous bars and blotches of black mostly on the inner web but sometimes on both. Lesser wing-coverts almost uniform greyish. The buff bars are lightly outlined in blackish. Primaries and secondaries grey-brown, shading to chestnut at the bases, the latter with buffy vermiculations. Central tail feathers greyish with irregular buff bars, remainder of rectrices blackish with less distinct barring. Feathers of chest and upper breast pale buff with faint irregular cross-bars, greyish mottled tips, and heavy chestnut areas on one or both webs. Sides of chest more greyish. Lower breast buff with irregular angulated dark brown to black bars, giving the area a somewhat spotted appearance. The flanks are more narrowly barred but are ornamented with large chestnut areas on the lower webs. Abdomen greyish with indistinct cross bars.

Female:

This is very like the male but is rather more speckled about the head and more barred on the back.

Wings in males 155-176; females 150-165. Bill blackish-brown, lower mandible yellowish at base. Legs and feet yellow ochre with olive tinge.

There is a certain degree of variation in the plumage of these birds but the above descriptions are taken from fresh clean examples. Birds inhabiting areas with red soil are very brownish while those from the Kedong for example are greyish.

JUVENILE:

... The chick is unknown to me and there appears to be no description of it. The young in second feather is rather more barred below, more barred and marbled on the back and with a darker head. There is a little or no chestnut on the flanks.*

HABITS:

The Ulu Grey-Wing is still fairly plentiful in the less settled areas but requires careful nursing if it is to hold its own in the farming zones. Natural enemies are plentiful, such as Jackal, Mungooses, Wild Cats, etc., whilst amongst bird enemies the Secretary Vulture must be accounted the worst offender. In June of this year I watched a pair of Secretary Birds literally running down a small covey of " cheepers " nor more than a fortnight old. The youngsters tried in vain to use their sprouting wings to evade capture, but the way in which the Vultures followed up first one then another in this direction and then that was almost uncanny; they seemed to know exactly in which direction to follow up the chicks which had dispersed in all directions when first attacked by the birds.. Five chicks were accounted for before I interposed and drove the Vultures off.

Grey-wings are usually found in the grass and scrub country and are rather partial to broken ground such as one finds on hillsides in the Machakos country or in the Kedong. They lie up during the heat of the day under bushes in dongas and near water-courses. When not breeding they go in small coveys of ten to a dozen or so but as the season comes on they split up into pairs. The parents remain with their parents for some time, thus towards the late season one may happen on a covey composed of parents and young of the year.

In the early mornings and late evenings one may find these birds in the vicinity of maize cribs or places where maize cobs have been shelled, picking up scattered grain. These birds undoubtedly do scratch up a small quantity of sown grain, but this damage is more than counterbalanced by the tremendous good they do in keeping down obnoxious insects. They feed quite a lot on young locusts and other insects, including white-ants, besides other mixed diets as seeds, bulbs, etc.

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* Young of all Francolin in all stages are urgently required for the Museum collections.

The Grey-wing in my experience is a foolish bird so far as the gunner is concerned. If a covey is put up and allowed to go to ground without being shot at, it is quite possible to mark the several birds down and then walk them up, and secure them one after the other; for the stupid birds do not run far, but prefer to squat still. When the birds first get up they do so with a shrill scream, afterwards remain quiet.

As regarding their nesting season, such observations as have been made go to shew that they nest twice a year at periods corresponding to the rains more or less, but odd broods have been observed at other periods. My own records shew eggs in February, May, and July, and again in November, and young in June, August, December and January. The eggs are olive-brown or buff with brown speckling or dark pores. Average size 38 x 29 mm. The nest is usually scratched out under a bush or clump of grass.

Francolinus (Scleroptila) africana nr. ellenbecki, Erl. Northern Grey-winged Francolin.

Ref. Erlanger, J.f.O. 1905, p. 151.

Distribution: Northern Guasso, Nyiro, northwards to Marsabit and Matthews Range.

Description:

Somewhat like the previous race but less brownish above, more dark greyish, with a greater distribution of black on the back. Eight areas on the underside pure white with jet blck pattern to feathers so arranged that the white terminal areas are divided into two round spots. Chestnut on flanks and breast much deeper. Abdomen and under tail-coverts very distinctly barred black and white. Size as for *uluensis*. Habits as for previous race.

Francolinus (Scleroptila) shelleyi, Og-Grant. Shelley's Red-winged Francolin.

Ref. Og-Grant, Ibis, 1890, p. 348.

Type locality, Umvuli River, Mashonaland.

Distribution: South-western Uganda. This species enters the South-western corner of Uganda and is here recorded on the authority of Mackworth-Praed, Ibis, 1922, p. 119.

Description:

Crown to nape dark brown, with darker centres. Supercilia golden rufous extending down the neck and meeting at the back.

Parallel to this but expanding at its lower end, a black and white speckled line extending from the back of the eye along the side of the neck. Cheeks, ear-coverts and side of neck golden rufous, separated from the white chin and throat by a black and white speckled line which entirely encloses this area. Chest and flanks rufous, each feather with a buff shaft-streak, slight vermiculations and greyish tips to those on side of chest. Breast and abdomen buff with blackish irregular bars; under tail-coverts greyish buff-barred. Mantle, scapulars, inner secondaries rump and upper tail-coverts umber-brown shaded with greyish brown, slightly vermiculated each feather with a pale shaft stripe outlined with darker brown or black; many of the feathers with dark blotches of rufous and black, mostly on the inner webs. Primaries rufous, mottled with dark brown

Female:

Very like the male but duller and with less head ornamentation. Wings, 160-185 mm. Bill, blackish brown; base lower yellowish. Legs and feet ochre yellow.

Habits:

These birds frequent the grass and bush-veld and go in coveys of six or so. They lie very close and are difficult to put up without a dog. Like other Francolin they indulge in a morning and evening call, the cock bird taking up his position on a stone or ant heap. They are great diggers and feed largely on rootlets and bulbs.

I have no records of their nesting season in Uganda.

Francolinus (Scleroptila) elgonensis, Og-Grant. Elgon Red-wing Francolin.

Ref. Og-Grant, Ibis, 1891, p. 126.

Type locality, North Mount Elgon. 11,000 ft.

Distribution: Mt. Elgon district to Aberdares and Mt. Kenya and Mau.

Description: Male, Adult.

Feathers of crown black, edged with rusty brown, and buff, shading to rufous on the nape; each feather with black tip. Lateral part of distal crown white with large black tips, extending back and downwards and then forwards to meet a similarly coloured line which extending from just above the gape passes back below the eye and ear-coverts and encircles the pale throat patch. These lines therefore enclose the yellowish buff patch on the side of the neck and of the throat. Lores, supercilia, and cheeks also yellowish-buff. Ear-coverts brownish. Lower neck orange buff shading to light chestnut, each

feather with a black spot at tip; breast, flanks and upper abdomen light chestnut, the feathers of the breast with paler shafts and grey tips; the flank feathers with paler upper webs which are cross-barred with blackish. Lower abdomen greyish-brown, barred with darker brown. Mantle, scapulars, rump, upper tail-coverts and rectrices greyish-brown on the outer webs shading to black on the inner webs, each feather with two or more cross-bars and with a distinct white shaft line; giving to the dorsum a checkered appearance. Primaries and secondaries light chestnut barred and mottled with blackish-brown, especially at the tips.

Bill horn blackish-brown; base of lower mandible ochre; Legs ochre yellow, feet more dusky. Wings 175-188 mm.

JUVENILE:

The young birds are unknown to me.

HABITS:

This Francolin is an inhabitant of the high grass veldt between 8,000 and 11,000 feet. It is a close squatter and may thus be overlooked, for it is not easily flushed. When it does get up it goes off with a whir which is quite startling in its suddenness.

It lives largely on the bulbous roots of certain grasses and also takes a fair amount of green food. Various seeds and insects also go to make up its daily diet. The coveys are small, usually four to six. I have no records of its breeding seasons nor do any appear to have been published.

Francolinus (Scleroptila) levaillanti kikuyuensis, Og-Grant. Uasin Gishu Red-winged Francolin.
Ref. Og-Grant B.B.O.C. Vi, 1897, p. 23.
Type locality, Eldoret.

Distribution: Uasin-Gishu Plateau, Nandi to Sotik, South Kavirondo and on the Mau.

With this race is united *F. mulemæ*, Og-Grant, which is a synonym.

DESCRIPTION: MALE ADULT.

Central part of crown and nape blackish with rusty edges to the feathers. This area is outlined especially on the posterior to the eye by a narrow line of black and white feathers. The sides of the forehead, lores, and the wide supercilia golden rufous extending down the side of the neck and meeting at the back, thus forming a wide collar. Chin and throat white to very pale buff, shading into golden

rufous like the sides of the neck but separated from it by a row of white black-tipped feathers which extend in gradually widening formation from the gape, through the lower portion of the ear-coverts, downwards to encircle the throat patch. These black and white feathers also extend round the back of the neck along the lower edge of the rufous of the hind neck. Ear-coverts whitish below and chestnut above. Chestband bright chestnut, with pale buff shaft-streaks and buffy margins. Breast and flanks and upper abdomen, rufous buff, irregularly spotted and somewhat barred with black or very dark brown.

Feathers on the side of the chest and on the flanks with large chestnut patches, the latter with irregular greyish-brown barring outlined with blackish. (Some specimens from Cherangani are very heavily spotted and barred on the breast).

Abdomen greyish with buff and dark cross bars. Under tail-coverts buff with greyish-brown and blackish vermiculations.

Mantle, scapulars, inner secondaries and rump, dark blackish-brown with buff-streak on either side of a white shaft and wavy narrow cross bars, these latter outlined with black. The darkest features are always the dorsum. Some of the mantle feathers have greyish tips when fresh. The buff bars and black areas on the lower back give the bird a checkered appearance. A certain amount of chestnut is present on the upper mantle. Upper tail-coverts and central rectrices blackish-brown with greyish-buff cross bars shaded with black. Remainder of tail feathers dark brown to black with indications of paler barring and vermiculations.

The lesser wing-coverts have a decided greyish tinge while the secondary coverts are rufous to pale chestnut. Primaries and most of the secondaries light chestnut with speckling and barring towards the ends. Bill horn-brown with yellow at base of lower mandible. Legs and toes ochre-yellow with olive tinge. Wings 165-179 mm.

FEMALE:

The sexes are almost alike except that the female is usually more spotted below.

JUVENILE:

The chick is buffy below, rather paler on the throat and belly; forehead, supercilia and sides of neck richer buff with a chestnut line running through the ear-coverts. Centre of crown bright chestnut; dorsum, rich buff with chestnut line down the centre laterally. Wings mottled with chestnut.

In first feather the head remains in down, but the sides of the chest, the scapulars and larger coverts and flanks are dark brownish

with white to buff shaft-streaks with cross bars and tips of the same colour, giving to these areas a striped and spotted appearance. Primaries, secondaries and tail brownish with fine blackish vermiculations and buff edges. In the next stage the head and breast become feathered but retain the general colour of the previous stage.

Habits:

This Francolin is essentially a bird of the grass veldt but it undoubtedly is partial to hillsides. I have not seen it near flat, swampy land. The coveys are not large, perhaps six to eight birds. They are of a somewhat nervous disposition and when danger threatens they run and squat, so that it is not easy to put them up without a dog. When they pitch they make off in different directions so that one is never certain of putting them up just where they landed.

These birds act as heralds of the dawn; at the first streak of daylight they begin to move; the cock will mount an anthill or other prominence and begin calling. The call is very like the sylables Ki-el-di-werk. These birds used to be plentiful on the Londiani-Eldoret road, being particularly numerous near Lake Narasha. For quite a long time a pair frequented the District Commissioner's garden at Eldoret. They spent the day in a tangle of thornbush and came out with great regularity just on five o'clock when the male would mount a stone wall and challenge the neighbourhood. This pair nested for several seasons under a stunted bush not ten yards from the garden wall; the nest was a shallow depression fairly well lined with grass. Never more than eight eggs were laid, buff with brownish freckling and dark pores, measuring on an average 28 x 40 mm. My records shew eggs from May to July and September, and in January and February and young in first feather in September and February.

Francolinus (Chaetops) lchterorynchus emini, Neum. Uganda Striped Francolin.

Ref. Neum, O.M. 1907, p. 198.

Type locality, West of Lake Albert.

Distribution: The whole of Uganda and Lado Enclave.

With this race I unite *F. ugandensis*, Neum. as a synonym.

Description:

Crown dark umber-brown shading to black on the forehead. Loral spot black; ear-coverts brownish. Supercilia and streak from

nostrils to below the eye, white. An area just above the gape black merging into a black streaked white area extending from the cheeks to side of neck and round to the nape. Feathers of the neck and upper chest black with wide buff margins and elongate buff shaft-stripes and spot at about the middle. In the areas of the breast and flanks the distribution of colour alters, the feathers being buff with irregular blackish-brown shaft-stripes containing a buff area in which there are one or two irregular blackish spots. Many of the flank feathers have in addition, broken lateral blackish lines, and in some examples of males and old females there is a wide chestnut area mostly on the lower webs but sometimes also on the upper. (This variety has been named '*Ugandensis*' Neum.). Abdomen greyish with wide buff ends. Vent greyish with indistinct buff barring. Thighs buff, each feather with long blackish marks centrally. Mantle and scapulars and wing-coverts blackish brown with buff to whitish sub-marginal irregular lines; some central buffy marks; black vermiculations, and brownish shafts. Secondary coverts and innermost secondaries, blackish-brown more greyish on outer webs, irregularly barred with buff, and with blackish shading along the shaft graduated to a point at the tips of the feathers. Primaries and secondaries blackish-brown barred with buff and toothed with the same on the outer web.

Rump, upper tail-coverts and rectrices, brownish with greyish tips barred with greyish-buff, vermiculated with blackish and in the region of the rump dark shaft-streaks to the feathers.

The sexes are alike, but the female is smaller and lacks spurs. Old males develop two pairs of spurs.

Bill horn-brown, yellowish at base of lower mandible; Legs cadmium yellow. Wings 165-188 m.m.

There is a variety of this race which is very dark, especially on the head and chest; the latter region lacks entirely the pale areas to the centre of the feathers and the buff border is very narrow. The throat is pure white. It thus resembles somewhat *F. gedgei*.

JUVENILE:

The young chick is very like that of *F. squamatus*, but is paler throughout, especially on the crown and underside.

I have no records of the young in first feather, but in the next stage they are somewhat like the female, but more striped and barred above and more spotted on the coverts.

HABITS:

This handsome Francolin has a wide distribution in Uganda, but I have never found it common. They are mostly to be met with in pairs or small coveys in the scrub country or in the vicinity of cultivations.

They are most in evidence in the early morning at which time they call, and also in the afternoon when the sun is low. An ant heap is the favourite calling perch, but I have not infrequently observed them on low trees. They can run like Hares, and if suddenly flushed they take to trees and when dislodged make an easy target. The call is quite distinctive, somewhat like the syllables N'ti-ter-ri, n'ti-ter-ri.

They do a certain amount of damage to native potatoes which they dig up while still young, but as they take a large number of injurious insects, both larvæ and adults, one can forgive their depredations in this direction. They have, however, taken to digging up half-grown groundnuts—a much more serious offence, but as their numbers are small the damage is negligible.

These birds have been found nesting from March to July and in December, while young have been observed in July and January.

The nest is of the usual Francolin type and placed under a small bush or at the foot of a tree. The eggs, usually six to eight, are greyish-buff with little or no speckling.

Francolinus (Chaetopus) clappertoni griseosus, Mearns. Greyish Striped Francolin.

Ref. Mearns, S.M. Col. No. 20, 1911.

Type locality, Lokko, Zegga, Bar-el-jebel North Lake Albert.

Distribution: The sudd districts north of Lake Albert, Bar-el-jebel.

Description:

Smaller than *F. gedgii*, and more greyish above. As I have no specimens I quote the original description:—" Crown and ear-coverts prouts brown; feathers of upper side of neck and mantle black or brownish-black, bordered with white except at the tips, and with narrow white shaft-stripes posteriorly; general colour of remainder of upper parts greyish drab; feathers of back and rump with sagitate black markings and pale shaft-stripes; outer surface of wings spotted and irregularly cross-banded with greyish rusty-white; wing-quills dark brown, cross-banded with rusty white and without longitudinal markings; tail brownish-black, narrowly cross-banded with greyish-white or rusy-white; sides of head and neck buffy white, narrowly striped with black; chin and throat plain buffy white; remainder of under parts pale buff with brownish-black markings, those of the chest V-shaped, with gutttae extremities on the lower breast and sides, becoming oval or elyptical and sparse on the abdomen, and irregularly hastate on the posterior flanks and upper thighs; under tail-coverts buffy-white, broadly banded with dark brown."

Wings 155mm.

Habits:

Neither the habits nor the early stages have been recorded.

Francolinus (Chaetopus) clappertoni gedgii, Og-G. Gedge's Striped Francolin.

Ref. Og-Grant, Ibis, 1891, p. 124.
Type locality, Plains N.E. Mount Elgon.

Distribution: Uganda from Mt. Elgon west to Toro.

Description:

Crown from forehead to nape, dark brown; lores and supercilia white, the latter spotted at the distal end; a white line below the eye, followed by a brownish line extending from the gape to the cheeks where it breaks up into spots on a whitish ground. Ear-coverts brownish, with small white flecks; throat pure white; sides of neck, chest and underparts buff with broad dark shaft-marks; flanks similar but with a considerable amount of chestnut on one or both webs. Mantle, scapulars, wing-coverts, and rump, dark brown with narrow buff margins, and a few buff spots on the secondary coverts.

Primaries and secondaries dark brown with paler edges to the outer webs and rusty brown irregular banding on the inner secondary feathers. Bill horn-brown, paler at the base of the lower mandible. Legs orange-yellow, feet darker, bare patch round eye dull yellow. Wings 180-199 mm. The female is like the male except for more spotting on the coverts, and in size is slightly smaller.

The young are unknown to me and have never been described.

Habits:

The type of country inhabited by this bird is similar to that frequented by *F. icterorhynchus emini*, that is grass lands where there are small trees and bushes, but it also is found on the rocky hillsides with sparse vegetation. They feed along the patches of native cultivation and are most in evidence in the early morning and late afternoon. The nesting habits have not been recorded.

Sir Frederick Jackson found these birds plentiful in the Elgon district and in the Maanja Valley.

Francolinus (Chaetopus) hildebrandti hildebrandti, Cab. Hildebrandt's Francolin.

Ref. Cabanis, J.f.O. 1878, p. 206.
Type locality, Teita country.

Distribution: North of shimoni to Teita and Kilimanjaro, north to Natron and east to Ukmbani and south of the northern Guasso Nyiro. (Typical race).

Description: Male Adult.

Crown to nape, greyish brown with darker centres and buffy grey tips; a blackish line passes through the eye from the lore to the upper edge of the ear-coverts. Ear-coverts brownish; supercilia, cheeks, neck and throat white with dark centres to the feathers, those of the neck more rounded and terminal; lower neck, chest, flanks white with an irregular black cross mark towards the base and a cordate black spot towards the end; the spot on the flanks are more elongate, less blackish and somewhat freckled. Abdomen buffy white, with some slight barring; under tail-coverts buffy white with brown banding outlined with blackish.

Margin of chest and hind neck black with white shaft-spots and sub-marginal irregular white lines; terminal shaft spots chestnut. Rest of upper surface grey-brown with rusty tinge towards the centre of each feather, ornamented with fine black vermiculations and bars. Primaries and most secondaries grey-brown with fine vermiculations on outer webs and tips; inner secondaries upper tail-coverts and tail more brownish and more plainly vermiculated.

Female, Adult:

Somewhat like the male on the upper surface from crown to tail, but less definitely black and white on the neck and with more rufous along the shafts of the feathers especially on the mantle, scapulars and wing-coverts. The under surface however differs considerably; the pale areas of the throat and head are rufous-buff, while the cheeks are rusty-grey. The lower neck, chest, breast, flanks and abdomen are dull ochreous-orange, slightly paler at the tips and somewhat vermiculated with blackish, especially on the sides of the chest and on the flanks. The lateral chest feathers have greyish tips. Thigh feathers have pale buff spots and terminal bands.

Juvenile:

The chick in down has the head and neck mostly yellowish-buff with a black line from the lores through the eye to above the ear-coverts; a wide central line on the crown, rich chestnut outlined in black. The dorsal surface has one central and a lateral chestnut line on a buffy ground. Wings buffy speckled with chestnut. Under-surface yellowish-buff with a greyish tinge on the breast.

In first feather the head is coloured as in the chick; breast and sides of body sandy-buff each feather with a white shaft-spot and triangular terminal white mark. Hind neck and mantle with feathers of the same pattern but buff spots are replaced by olive brown, the white shaft spots are reduced in size and tinged with rusty-brown and in addition there is a pronounced sub-terminal black area. Scapulars,

coverts and inner secondaries, brownish, slightly vermiculated and with a distinct angular black pattern on inner webs. Primaries and outer secondaries olive-brown with blackish freckling and bands and dentate buff markings on the outer margins. The fully mature plumage is not reached until the third year.

Habits:

Hildebrandt's Francolin (including races), throughout the whole of its distribution, frequents the thick thornbush and grass country and is most numerous as the race '*altumi*' in the Rift Valley from the Kedong to Elmenteita. It is partial to rough, rocky hillsides where vegetation is plentiful and affords sufficient cover. It is thus a bush-loving bird and as such it runs to cover at the slightest provocation and is then difficult to flush without the aid of a dog or beaters. If put up amongst trees it will frequently perch.

It is a very noisy bird and may call during any time of the day, especially just before the breeding season; but as with most Francolin it is heard most often at dawn and evening.

The coveys are small and seldom exceed half a dozen birds, even during the late breeding season, so one can presume that the death rate amongst the young must be large, for the nests that have been brought to my notice have contained either six or eight eggs. Ground vermin, and wet weather coupled with grass fires acount for more casualties than anything else.

Nests have been recorded in January to August while young, from the chick to birds in first feather, have been noted in February, August and November.

Francolinus (Chaetopus) hildebrandti altumi, Fisch. Reichw. Naivasha Francolin

Ref. Fischer and Reichenow, J.f.O. 1884, p. 179. Type locality, Naivasha.

Distribution: Rift Valley from north of Magadi through Loita to S. Kisii east to the foot of the Mau, Kamasia and Elgeyu.

Description, Male:

Very like the typical race but less brownish above, more greyish, and with clearer black below.

Female:

It is in the female sex that the difference between this race and the typical form is most marked. The chief points of difference are

the greyish tone to the whole of the upper-side; pale buff on the head and throat, the latter well-defined from the lower neck and chest; the chest and breast have a scaly appearance due to the feathers having darker centres and sub-terminal spots and pale greyish edges. Many examples have a blackish freckling over the chest.

Juvenile:

First feather. Somewhat like young of typical form, but much darker above and below; the feathers of the mantle, scapulars and innermost secondaries with much larger black areas.

Francolinus (Chaetopus) hildebrandti helleri, Mearns. Lololokui Francolin.

Ref. Mearns, P.U.S.M. 1915,
Mt. Lololokui, Northern Frontier.

Distribution: From the north bank of theN. Guasso Nyiro, to Mt. Lololokui and Matthew's Range, Barsaloi, Ndoto and Marsabit.

Description: Male Adult.

Differs from the typical race and the previous form in being darker above, and pure black and white below.

Female:

Darker above, more olivaceous, and darker cinnamon below. Wings with no pale edgings to the feathers.

Francolinus squamatus.

We have now to deal with a species of wide distribution throughout Kenya and Uganda, which appears to alter in colour to quite a considerable degree in various localities, but as with the Sephæna, it is most difficult to assign a definite range to any particular form. The result has been endless confusion. The late Dr. Mearns boldly applied racial names to several varieties but no exact boundaries were defined for any one form; subsequent writers have therefore been at a disadvantage in discussing these races and Mearn's work has fallen into disrepute. In spite of long observation on the spot, I am not in a position to give a definite opinion of any of the supposed forms. It is however more than possible that when very long series are got together from the various type localities and their immediate surroundings, that we shall have to uphold some if not all of the races described. I therefore propose to detail these forms and to leave the question as to their validity open.

Francolinus (Chaetopus) squamatus maranensis, Mearns. Kenya Scaly Red-legged Francolin.
Ref. Mearns, S.M. Col. 1910, No. 14, p. 1.
Type locality, Kilimanjaro.

Distribution: Kilimanjaro (foothills) area, to Lake Magadi, and east to southern Ukambani.

Description: Male Adult.

Crown sepia; feathers of back and scapulars dark brown, edged, except at tip, with pale grey, with chestnut shaft streaks and coarse marginal black speckles; lower back, rump and upper tail-coverts vandyk-brown; rectrices vandyk-brown broadly banded with black; feathers of chest broccoli brown with broad apical shaft-stripes of prouts brown, without speckles; lower breast, upper abdomen and flanks broccoli-brown with darker brown centres to the feathers and narrow sub-marginal creamy-white stripes. Throat greyish-buff.

Bill bright coral red; Legs and feet orange-red. Bare patch above the ear ochre, to orange. Wings 175-196.

Female:

Very similar to the male in colour but more mottled above, and smaller.

Juvenile:

Chick in down: Upper surface bright chestnut, slightly mottled with blackish on the back. Head with two buff lines commencing at the base of the bill, passing back, one on either side of the chestnut coronal patch (which is outlined in blackish) through and above the eye and forming wide superciliary stripes, and reaching the nape of the neck where they join. Two interrupted buffy lateral lines outline the dorsum of the body. A short black line is present just posterior to the eye. The undersurface of the body is buffy tinged with brownish on the breast and flanks. Thighs sandy buff mottled with chestnut.

In the first and second feather the young is as follows:—Crown olive-brown with slightly darker tips and rusty shaft-streaks; supercilia, lores and throat buffy-white; cheeks greyish-brown streaks with white; ear-coverts brownish; neck band and chest greyish-brown with conspicuous triangular terminal spots and blackish sub-terminal areas; feathers of mantle, rump and scapulars rusty brown with greyish edges, fine blackish vermiculations, chestnut shafts and large blackish sagittate shaft spot to each feather; coverts more rusty brown with fine blackish shaft streaks, the inner tertiary coverts with white or

buff terminal shaft-spot, and a large black patch on the inner webs. Secondaries and primaries greyish brown internally and rusty brown on outer webs, vermiculated with blackish and irregularly cross-barred with rusty-buff; some of the innermost secondaries with blackish marks. Feathers of breast greyish shading to brownish and black at the tips of each feather, all edged with greyish-buff and with brown shafts; lower breast and flanks with much wide buffy margins to the feathers and less greyish; vent and under tail-coverts brownish broadly banded with buff and blackish-brown. Rectrices rusty brown, finely vermiculated with blackish and banded with buff outlined above with black.

The full adult plumage is gradually assumed and is not complete until the third year. (Observed in captive birds).

Habits:

The Scaly or Red-legged Francolin is one of our commonest Game birds and is worthy of all the preservation we can give it, preservation not only from the man with the gun but more so from the native who traps the birds or takes the eggs to sell to Europeans and Indians.

The Red-leg and the common Spurfowl suffer more at the hands of the natives than any other game bird, with the exception of Jackson's Francolin; if it were not for the fact that there is always a market, the natives would not molest these birds to any appreciable extent.

The type of country frequented by this bird is the edge of the forest belt or thick bush bordering rivers and streams. I have not seen them actually in the interior of the forests but there is evidence to suggest that at times they do penetrate quite a distance. They leave the forest at dawn and frequent native shambas and other cultivations but as the day advances they retire until the evening when they again venture out into the open. In certain parts of the Kikuyu reserve round Nairobi where the forest has been cut out, a few of these birds eke out a precarious existence in the more dense scrub. The coveys are usually small and composed mostly of young non-breeding birds. The red-leg is a noisy bird, especially towards evening when it will perch on some prominent position and call loudly.

Where these birds have been little molested one can walk them up fairly easily, but in most localities they are timid and have to be hunted with good dogs. They are inclined to run rather than fly, but if flushed in the vicinity of trees they readily take to this cover.

I do not consider that the Red-leg does much damage, a few grains of corn or other grain may be taken, but the quantity is negligible. They devour large quantities of insects and larvæ and are especially fond of white-ants. My records shew that nests of this

Francolin have been located in nearly every month of the year but are most numerous between May and August and December and January.

The eggs are pinkish-buff to sandy colour, with distinct pits and pores. The clutch is usually small, about six to eight. The nest is of the usual type and scratched out under a bush or tuft of grass.

These few remarks apply to all the races of '*squamatus*.'

Francolinus squamatus kapitensis, Mearns, Kapiti Scaly Francolin.
Ref. Mearns, S.M. Col. No. 14, p. 2, 1910.
Type Locality, Juja.

Distribution: Athi district, Kikuyu, Kiambu, Nairobi, Ngong, and North Ukambani.

Description:

"Crown brownish-olive mixed with grey; feather of black and scapulars greyish hair-brown mixed with black, broadly bordered with hair-brown, without chestnut shaft-streaks or conspicuous marginal black spots; general colour of lower back rump and upper tail-coverts olive-brown; outer webs of outer primaries plain dark brown, rectrices mars-brown coarsely vermiculated with black; feathers of chest hair-brown with narrow apical shaft-stripes of broccoli-brown, thickly flecked with black near the shafts; lower breast, upper abdomen and flanks hair-brown dotted with black near the feather-shafts and with broad creamy buff submarginal bands."

Francolinus squamatus keniensis, Mearns, Kenia Scaly Francolin.
Ref. Mearns, Op. cit.
Type locality, Nyeri, Mt. Kenia.

Distribution: Mt. Kenia and the Aberdares.

Description:

"Crown bistre; feathers of back and scapulars bistre thickly vermiculated with black, and narrowly bordered with brownish-grey finely mixed with blackish; lower back, rump and upper tail-coverts bistre vermiculated with black; outer webs of outer primaries plain dark brown; rectrices brown, finely vermiculated with black; feathers of chest hair-brown with large apical spots of sepia; lower breast, upper abdomen and flanks sepia, the feathers broadly edged with buffy white pencilled with sepia."

Francolinus squamatus subsp. 2. Mau Scaly Francolin.
Ref. Praed, Ibis, 1922, p. 133.

Distribution: Elgeyu to Mau and upper Sotik, Nandi South to Njoro.

Description:

A race with a very dark almost uniform brownish upper side—not much greyish to the edges of the feathers. Somewhat like the Uganda race, but more contrasted brown and buff-white below; size large. Wings 192-200

Francolinus squamatus dowashanus, Mad. Mara Scaly Francolin.
Ref. Madaraz, A.M. Nat. Hung. XIII., 1915, p. 394.
Type locality, Ngare, Dowash, River Mara.

Distribution: The thick bush along the streams of the Loita north to south Kisii and lower Sotik.

Description:

Intermediate betwen the Kenia and Mau race in colour of the upper side but quite distinct below, having the centre of the feather very dark brown, contrasting very much with the almost white lateral areas. Centre of abdomen almost devoid of brownish marks. Throat pure white.

Francolinus squamatus zappeyi, Mearns. Nyanza Scaly Francolin.
Ref. Mearns, S.M .Col. Vol. 56, No. 20, p. 4, 1911.
Type locality, East shore, Victoria Nyanza.

Distribution: Through Uganda to Kavirondo and along the south of Elgon.

Description:

" Most closely related to *kapitensis*, the palest and greyest of the recognised sub-species from which it may be readily distinguished by the very broad edging to the feathers of the under parts and the absence of coarse markings on the upper parts; the crown is greyer and less brownish-olive; the back and scapulars are much the same but with clearer grey margins to the feathers; the general colour of the lower back, rump, and upper tail-coverts is more olive-brown with the vermiculations obsolete, the outer webs of the outer primaries are plain dark brown; the rectrices are warm-brown with scarcely a trace of vermiculations; the feathers of the chest are greyish hair brown with apical shaft-stripes of broccoli brown, not flecked with black near the shafts; the feathers of the lower breast, upper abdomen and flanks are soiled greyish-white with shaft-stripes hair-brown; the under tail-coverts are hair-brown broadly bordered with buffy white.

There is some doubt as to whether this race is recognisable from typical *squamatus* from the Angola-Congo border.

The original descriptions of Mearn's races are given in full so that those interested may be induced to preserve specimens from the type localities mentioned and so help in the elucidation of the races of this variable bird.

Francolinus jacksoni, Og-Grant. Jackson's Chestnut spotted Francolin.
Ref. Og-Grant, Ibis, 1891, p. 123.
Type locality, Mianzini, Kikuyu.
Distribution: Kikuyu Escarpment, Aberdares, Laikipia Mau and Mt. Kenya.

Description:

Crown dull rufous; lores and round the eye dull reddish, supercilia, sides of head, hind neck, whitish with rufous chestnut marks; throat white and narrow rufous streaks; feathers of upper part of mantle, sides of chest, breast and flanks, rich rufous chestnut with white margins finely speckled with blackish; particularly on the flanks; mantle and scapulars greyish with fine black vermiculations and brownish centres to most of the feathers; wing-coverts, rump, upper tail-coverts olive-brown with faint black speckling; tail rufous-chestnut; primaries rufous-brown, outer secondaries darker but with rufous bars and brown speckling on the outer webs.

Bill coral-red; legs coral-red, slightly darker behind. Wings 210-230 mm. The sexes are very alike; the female is slightly smaller.

Habits:

This handsome Francolin, the largest in Kenya and Uganda, is a bird of the high country, inhabiting the bamboo zones throughout its range. In such a dense retreat it is seldom seen but evidence of its existence is plentiful in the numerous ' runs ' which extend from these thickets into the more open country surrounding. These runs are for all the world like rabbit trails and lead to the makers' undoing, for the wiley native has learnt that a snare set in a frequented run is sure of a victim, and in this manner dozens of birds meet their doom. Dawn and evening finds these birds in the tangle of grass and scrub along the bamboo margins and it is to the sites of old Masai manyattas, as noted by Jackson, that these birds resort, to feed. Such places besides being covered in secondary growth are full of giant nettles and most unpleasant spots to walk in. The coveys are not large, three to four brace composed of probably a brood, for more usually one comes on these birds in pairs. They are exceptionally good runners and take to cover readily, but if flushed they often fly up into the bamboos.

Their food consists of the bulbous roots of a grass, green shoots, brambles and berries, besides certain grass seeds. They also consume a large amount of insects, particularly larvæ and beetles.

The young remain with the parents until the following breeding season.

The " call " is described by R. E. Dent " as extraordinarily like the sound made when sharpening a scythe with a whet stone." It has a peculiar metallic rasping tone.

When disturbed, they have a habit of uttering a low " chuck " which is very deceptive and difficult to locate—as the birds keep running about in the tangle of nettles to avoid observation. According to Dent they come to water at about 5 p.m.

The eggs and chick are unknown to me.

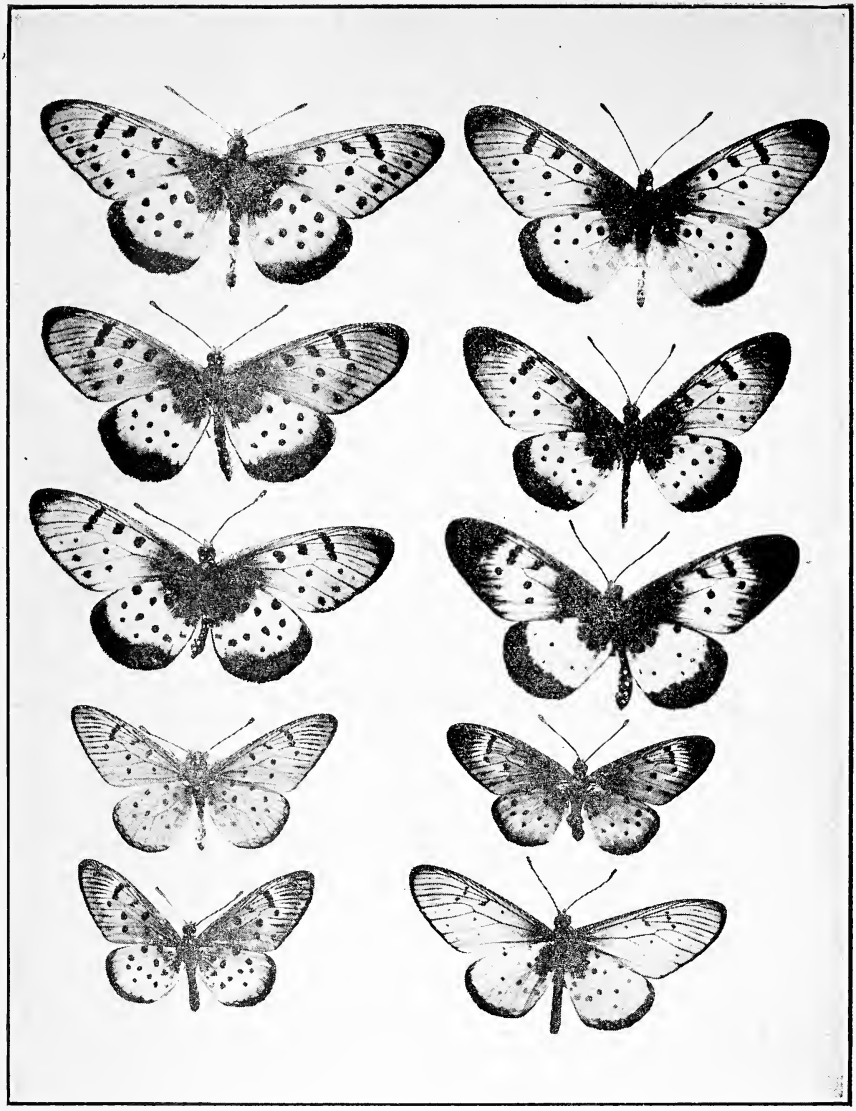

Photo: V. G. L. VAN SOMEREN.

Upper surfaces.

Fig. 1. Acræa cæcilia pudora. (Male).
Fig. 2. Acræa cæcilia pudora. (Female).
Fig. 3. Acræa cæcilia pudora. (Female).
Fig. 4. Acræa æquatorialis æquatorialis. (Male).
Fig. 5. Acræa æquatorialis æquatorialis. (Female).
Fig. 6. Acræa cæcilia cæcilia. (Male).
Fig. 7. Acræa cæcilia cæcilia. (Female).
Fig. 8 Acræa cæcilia cæcilia. (Female).
Fig. 9. Acræa æquatorialis æquatorialis. (Female).
iFg. 10. Acræa æquatorialis anæmia. (Female).

PART III.

SUB-FAMILY.—ACRÆINÆ.
GENUS.—ACRÆA.

41. ACRÆA ÆQUATORIALIS, Neave. Pl. I., figs. 4, 5, 9. Pl. VI., figs. 6 and 7.

Expanse 45-48 mm. General colour ochreous-pink, with slight transparent patch in fore-wing.

F.-w. Ochreous pink semi-transparent sub-apically; costa to hind angle narrowly black; sub-marginally a narrow orange band gradually merging into ground colour at hind angle and divided by blackish distal ends of veins; internal to this band a row of blackish inter-nervular rays, thinly scaled and causing the semi-transparent appearance to the sub-apical area. Spots as follows:—A large spot in cell at base of distal third; one or two on discocellulars, a series of five set transversely, beyond the cell, extending from 10 to 3; a large spot in 2; two spots in Ib, one sub-basal, the other directly below that in 2. Wing fringe white.

H.-w. Ground colour as fore-wing narrowly margined with black (fringe white); internally bordered by a series of indistinct inter-nervular arches; spotting as on underside, but mostly very faint with the exception of those in the cell; a slight basal blackish suffusion is present in most examples.

Underside: F.-w. Thinly scaled except at the apex and margin where there is a narrow orange band; spotting as above with two additional spots at base of costa.

H.-w. Salmon-pink, or pinkish-ochreous with marginal black line internally ornamented with distinct black arches enclosing orchreous spots; basal area with reddish-pink mark. Spots as follows:—Two in cell, sub-basal and central; two in 7, one sub-basal, the other mid-way; one each in 6 and 5 placed almost centrally; one in base of 4; one in 3, below and slightly nearer margin than that of 4; one in base of 2; three in Ic, one basal, one below and internal to spot in 2, and another mid-way between; two spots each in Ia and Ib; one spot each in 8 and 9.

Terminal half of upper side of abdomen creamy pink-white.

FEMALE:

Variable, the following forms are commonly met with:—

(*a*) Somewhat like the male but with heavier marginal black bands to the fore and hind-wings; spots more distinct; F.-w. with

a white transparent bar beyond the line of spots, and distally outlined with greyish scales. Hind-wing pinkish-ochreous or salmon-pink. Underside more ochreous, less pink; marginal arches distinct.

(*b*) F.-w. as in (*a*) but hind-wing with white rays running through the central pinkish area of the hind-wing.

(*c*) F.-w. ochreous-brown with a greyish tinge; h.-w. ochreous.

(*d*) Very like (*c*) but hind-wing white.

(*e*) Somewhat like (*a*) but fore and hind-wing ochreous.

Abdomens of all females blackish with white spots.

Early Stages:

The eggs are laid in groups but not all at one spot on the leaves or stem of a small weed which has a peculiar sand-paper-like surface and a very brittle stem. They are of the usual acræine type, whitish or cream when first laid, turning greyish as development progresses. The young larva is at first brownish, but at the second moult it becomes purply-brown with a central and dorso lateral white stripe and a wide white spiracular line; the under surface of the body is greyish-green; head rufous with an inverted V mark in the centre;—branched spines of uniform length are present on each segment brownish-black.

The pupa is long but not ornamented with spines; it may be either rufous or white with the usual blackish lines and spots.

The whole metamorphosis from egg to imago takes three weeks.

Distribution:

Kisumu and south Kavirondo, more sparingly on the Maragoli Escarpment. At certain times of the year it is extremely common in the grass and thorn-bush country south of Kisumu, this seems to be the type of country suitable to the insect. It has a slow flight and is easy of capture, but the best time to secure specimens is in the late afternoon when the insects go to "roost." They show a marked preference for one particular spot in which to rest for the night, and to this they may be seen flighting in dozens. They rest on the tall grass stems, and can be captured with the fingers with the greatest of ease.

42. ACRÆA ÆQUATORIALIS ANÆMIA, Eltr. Pl. I., fig. 10. Pl. VI., fig. 8.

Expanse 46-53 mm. General colour pale creamy-pink.

Somewhat like the typical form but very much paler. F.-w. very thinly scaled and spots indistinct, with an extra spot submarginally in 1b and 2, but often without the sub-basal spot of 1b.

H.-w. marginal band wide and blacker, with arches diffused; ground colour creamy to pale pinkish ochreous; terminal half of abdomen on upper side white.

Female:

Often like the male but pinker or whiter in the fore-wing; body black with white spots.

Early Stages:

Very similar to the typical race, but larva more brownish.

Distribution:

The coast from Tana to Vanga, inland to Kilimanjaro and Meru and Kikuyu Escarpment. It has a slow flight and keeps low to the ground.

43. ACRÆA CÆCILIA, Fabr. Pl. I., figs. 6, 7, 8. Pl. 4, fig. 2.

Expanse 55-70 mm. General colour ochreous to salmon pink, with black hind border.

F.-w. Ground colour ochreous pink, shading to light brown at the base and orange-ochreous marginally; costa and margin narrowly black; apex black, about 4 mm. wide; some of the veins blackish distally. Spots black and distinct, arranged as follows:—One in mid-cell; two discocellular; a transverse series of four beyond the cell; two in 3, one large central, the other smaller and more marginal; two in 2, one basal, one submarginal; three in Ib, one basal, one central, the other sometimes a twin-spot, sub-marginal.

H.-w. rather more pinkish with a wider hind-marginal border, outlined with orange; base with slight blackish suffusion; spots not very distinct, except those in upper part of cell. Abdomen mostly white, basally black.

Underside: F.-w. slightly paler than above, with reduction of black at apex; spots as above with two additional spots at base of costa; basal suffusion slight.

H.-w. pale ochreous-pink, shading to pink at base and margin, sometimes very rich pink; marginal border black with seven roundish white spots. Black spots as follows:—One in 8; two large spots in 7, one sub-basal, one mid-way; one in 6 at about centre; two in 5, one basal, one half way; one at base of 4; one sub-basal in 3; three in Ic, basal, one large just before origin of vein 2, third mid-way between this and margin; two each in Ia and Ib; Cell with two large spots.

Female:

Very variable; the marked forms are (*a*) Hardly distinguishable from the male, but with a whitish bar beyond the transverse row of

spots in f.-w. and with a blacker suffusion at base of fore and hind-wing. Body black with white spots.

(b) F.-w- as in male, but rich tawny; H.-w. pink. Var. *hypatia*.

(*c*) Fore-wing as in (*a*) but H.-w. white centrally, and at inner margin.

(*d*) All the ochreous areas replaced by white in fore and hind-wing, spots in H.-w. obsolete.

EARLY STAGES:

The eggs are of the usual acræine type. The larva in the third stage is rich brown above, greyish below; ornamented above with three whitish lines, one central and two dorso-lateral; laterally there is a yellowish line just above the legs; head brownish with rufous spots at apex. Pupa, either white with black lines and spots or brownish with very indistinct lines.

DISTRIBUTION:

Uganda to Nandi and Kavirondo and Elgon, intergrading with the next race in the Loita and Baringo areas.

44. ACRÆA CÆCILIA PUDORA, ord. Auriv. Pl. I., figs. 1, 2, 3. Pl. IV., fig. 1.

Expanse 60-70 mm.

MALE:

Very like the typical form but with less black at the apex of the fore-wing, and with a row of sub-marginal spots from Ib to 5, and internal to this row a distinct greyish suffusion; spots in hind-wing more distinct. In some examples the spots in areas Ib to 4 are joined by blackish lines. The ground colour is not so pinkish; the basal half of the abdomen is black.

FEMALE:

Follows the general variation as found in the typical race, but one seldom meets with a specimen with white in the fore-wing, this is instead, greyish-brown or ochreous; in the hind-wing however, the white area is pronounced and frequently has a delicate pink shading.

EARLY STAGES:

Similar to the typical form.

DISTRIBUTION:

Loita and Kedong to Ukambani and Taveta.

This insect frequents the bush and grass country and is not found in forest. It occasionally occurs in Nairobi but is more plentiful in the Machakos district. It is allied to *A. oncæa*.

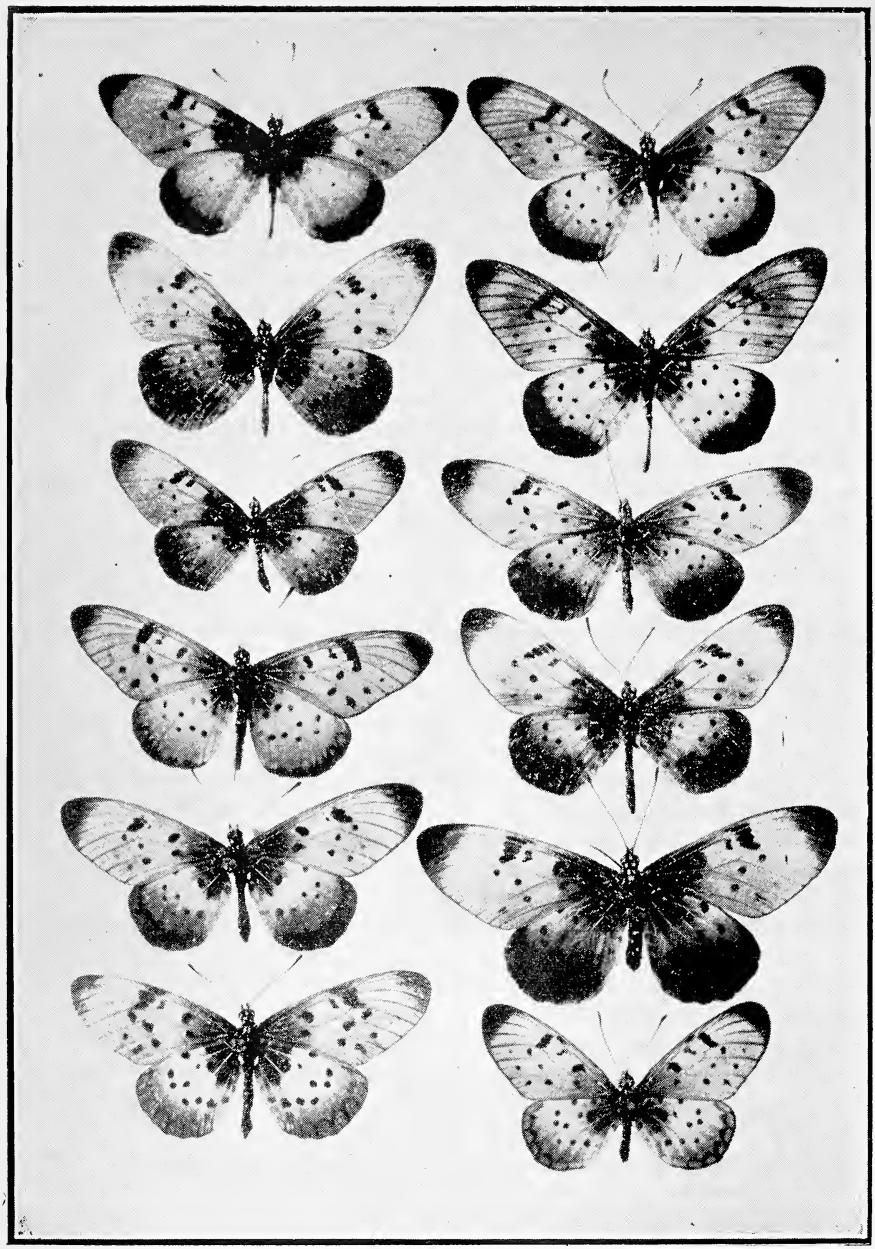

Photo: V. G. L. VAN SOMEREN. Upper surfaces.

Fig. 1. Acræa natalica natalica. (Male). (Dalgube).
Fig. 2. Acræa natalica natalica. (Female). (Dalgube).
Fig. 3. Acræa natalica natalica. (Female). (Dalgube).
Fig. 4. Acræa natalica natalica. (Male). (Nairobi).
Fig. 5. Acræa natalica natalica. (Female). (Nairobi).
Fig. 6. Acræa natalica natalica.
Fig. 7. Acræa natalica natalica. (Male). (Mongeya).
Fig. 8. Acræa natalica natalica. (Male). (Rabai).
Fig. 9. Acræa natalica natalica. (Female). (Rabai).
Fig. 10. Acræa natalica natalica. (Female). (Mongeya).
Fig. 11. Acræa natalica **natalica**. (Female). (Nairobi).
Fig. 12. Acræa natalica **natalica**.

45. *ACRÆA NATALICA*, Boisdv. Pl. II., figs. 1—12. Pl. IV., figs. 6—9.

Expanse, 45-80, average 70 mm. General colour orange-ochreous and pinkish-red with black margins.

As this is such a variable species, in both sexes, it will be best to describe the most abundant forms from a very large series, and to briefly indicate how other varieties differ from these.

F.-w. Ochreous-pink shading to orange outwardly; base broadly black to beyond centre of cell; costa and margin narrowly black, expanding at the apex into a black tip about 4 mm. wide; spots as follows: one mid-way in cell another at apex; a transverse series of five distal to the cell; two in areas 2, the distal one indistinct; two in Ib, central and sub-marginal.

H.-w. Rosy-pink shading to rosy-brown internal to a wide black marginal border; base with blackish suffusion; spots obsolete.

Such males predominate in the Dalgube-Vanga area, but they have an almost exact counterpart in the Nairobi district, but sparingly met with.

Underside: F.-w. paler than above and duller, with apical half pale ochreous with orange internervular rays; margin and tip slightly black. Spots as above with an additional one at base of costa.

H.-w. ground colour ochreous pink with reddish-pink at base and internal to the marginal border. Marginal border black, outlined internally with ochreous or yellowish-white, and enclosing large greeny white triangular spots. Spots as follows: one in 8; two in 7, a large one basal and a small one mid-way; one middle of 6; one or two in 5, basal and sub-marginal; one each in 4, 3, and 2; two in Ic, one large at base, and an elongate one at about mid-way; two in Ib; two in cell.

Var. B. The basal suffusion of fore and hind-wing less extended and not so intense; the hind-marginal band not so wide or dense, thus the arches or the underside show through; the spotting is however heavier and more distinct. (Vide plate).

Var. C. A third marked form is found along the forested areas of Rabai and Sokoke, and sparingly in Nairobi, and would appear to be a wet seasonal form. They are somewhat like var. B., but all the black areas are extended and in addition there is a blackish area beyond the cell of the fore-wing with the black scaling extending outwardly along the veins and so dividing up the orange sub-apical area. (Vide plate).

Intermediate forms occur throughout Kenya south of Lumbwa.

The females are even more variable, and no one form is limited to a given locality. The most abundant varieties are:—

(a) A form very like a male but with more ochreous suffusion on the fore-wing, and more distinct spotting; with a hind-

wing as in the male except that the marginal border is only slightly suffused with blackish in the form of arches. (Pl. II., fig. 12).

(*b*) Fore-wing as in the male but more ochreous, less pink; with a black border to the hind-wing, internal to which is a brownish suffusion extending to the apex of the cell. (Pl. II., figs. 3 and 5).

(*c*) Fore-wing as in (*b*) but richer tawny, a more marked basal suffusion, and with a hind-wing broadly suffused with blackish from the marginal border to well beyond the apex of the cell. (Pl. II., figs. 2, 9, and 11).

(*d*) Rather thinly scaled with greyish, and with a whitish sub-apical bar, and with the apex of the cell of the same colour. The hind-wing central area white, bounded internally by a brownish black basal suffusion and a brownish sub-marginal border. The marginal border indicated by blackish arches. (Pl. II., fig. 6).

(*e*) Like (*d*), but with a much wider white sub-apical band, but with more blackish-brown suffusion on the hind-wing, especially distally. (Pl. II., fig. 10).

Undersides: There are three main types: (*a*) with a hind-wing as in the male but the base is redder, while at the inner edge of the hind-wing marginal border the reddish is replaced with orange; further the black spots appear outlined with white. (Pl. IV., fig. 6); (*b*) a form in which the whole of the underside of hind-wing ground colour is white; the sub-marginal border being merely a series of large arches enclosing ochreous spots. (Pl. IV., fig. 8); (c) H.-w. very like (*a*) but pink replaced by red; marginal border a series of arches; cell spots large. F.-w. rich orange. (Pl. IV., fig. 9).

Early Stages:

The food plants of the larvæ of this acræa, so far as we have observed, are all Vines of closely related species, all having a curious green and white striped bark, ivy-like or pinnate leave, and with long tendrils for climbing. Some of the species are not like Passiflora. It is interesting to note in passing that this Acræa will feed on two species of Passiflora, *edulis*, and *cærulea*.

The eggs are laid on the undersurface of the leaves in groups of 20 or so. They are yellowish cream at first but turn orange then greyish as development proceeds. Like most acræine larvæ these caterpillars are gregarious, keeping together until ready to pupate. The newly emerged larva is blackish but turns a purply-brown in the last stage, with a narrow central dorsal stripe, an interrupted dorso-lateral line and a wide spiracular stripe extending from the third to last

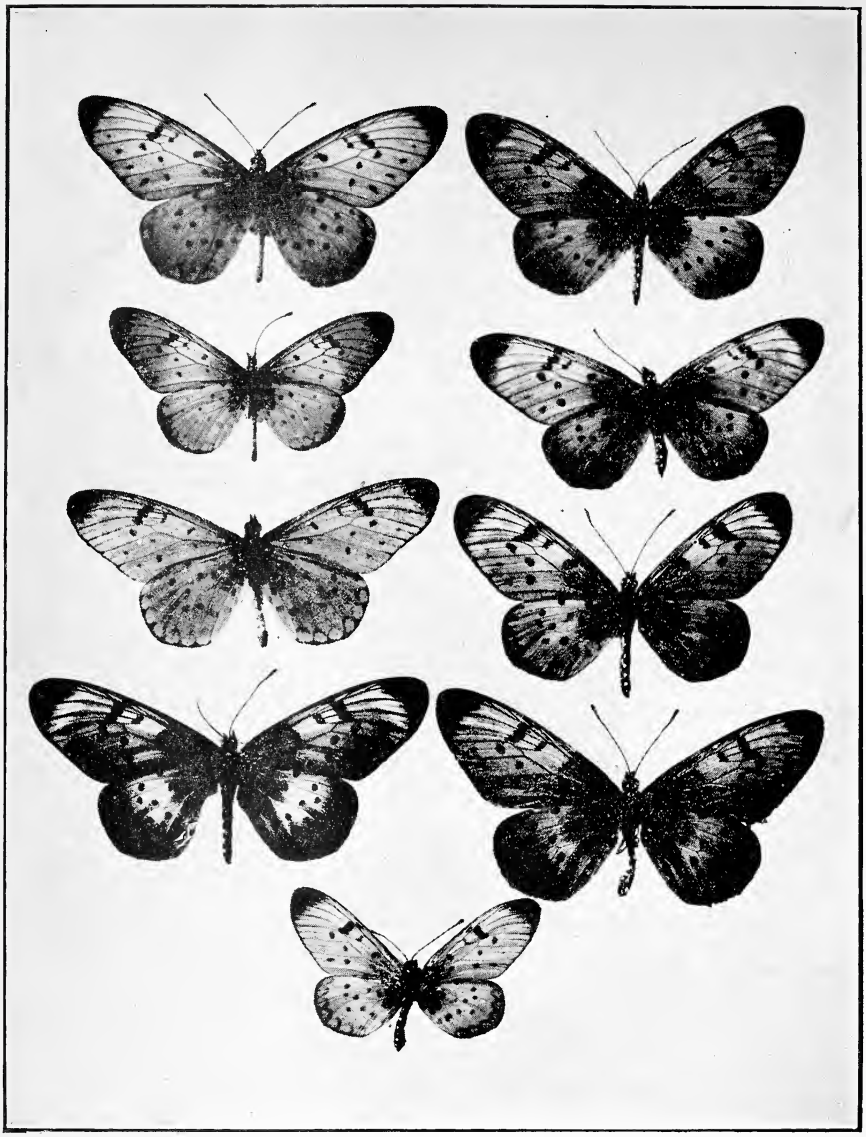

Photo: V. G. L. VAN SOMEREN.

Upper surfaces.

Fig. 1. Acræa natalica abadima. (Male). (Kaimosi).
Fig. 2. Acræa natalica abadima. (Male). (Jinja).
Fig. 3. Acræa natalica abadima. (Male). (Entebbe).
Fig. 4. Acræa natalica abadima. (Female). (Jinja).
Fig. 5. Acræa natalica abadima. (Female). (Jinja).
Fig. 6. Acræa natalica abadima. (Female). (Entebbe).
Fig. 7. Acræa natlica abadima. (Female). (Jinja).
Fig. 8. Acræa natalica abadima. (Female). (Jinja).

Fig. 9. Acræa natalica abadima. (Female). (Jinja).

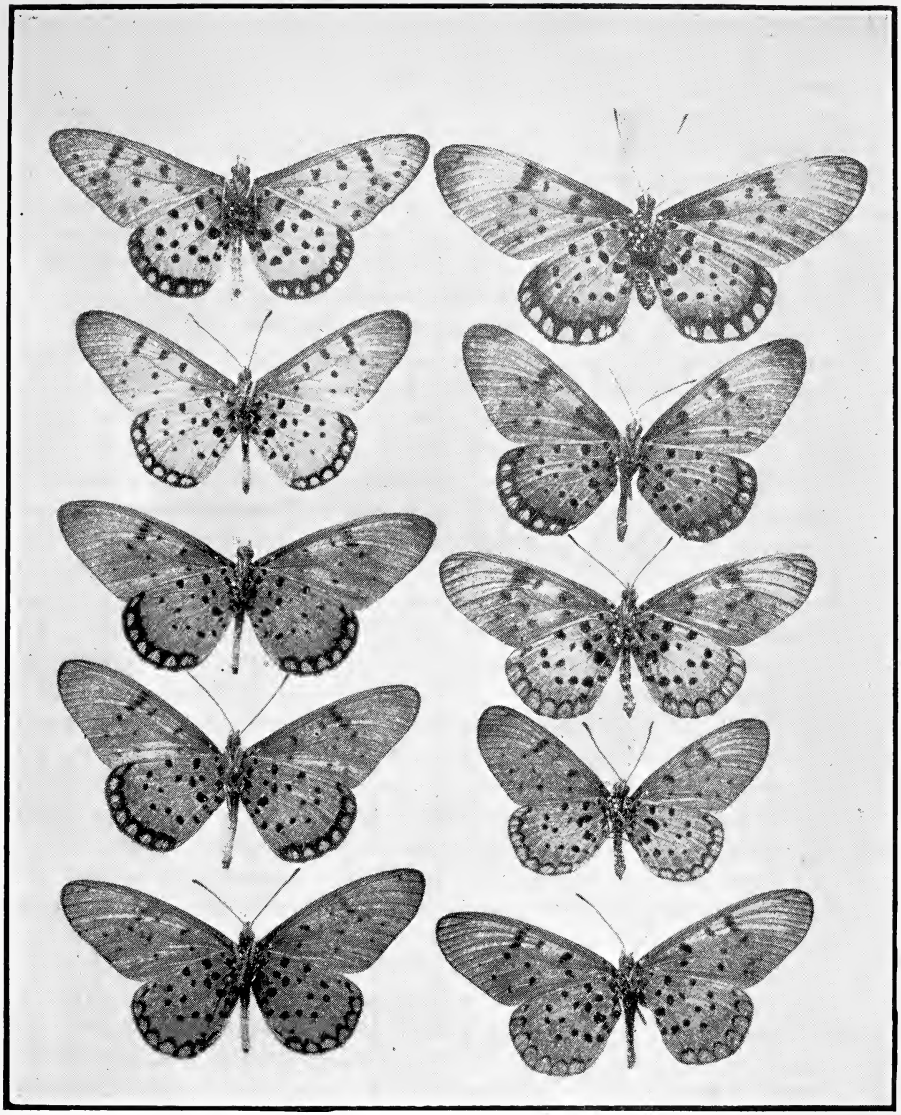

Photo: V. G. L. VAN SOMEREN.

Under surfaces.

Fig. 1. Acræa cæcilia pudora. (Male). (Nairobi.

Fig. 2. Acræa cæcilia cæcilia. (Male). (Elgon).

Fig. 3. Acræa natalica abadima. (Male). (Entebbe).

Fig. 4. Acræa natalica abadima. (Male). (Jinja).

Fig. 5. Acræa natalica abadima. (Male). (Jinja).

Fig. 6. Acræa natalica natalica. (Female). (Nairobi).

Fig. 7. Acræa natalica natalica. (Female). (Dalgube).

Fig. 8. Acræa natalica natalica. (Female). (Nairobi).

Fig. 9. Acræa natalica natalica. (Female). (Nairobi).

Fig. 10. Acræa natalica abadima, (Female). (Jinja).

segment, all creamy-white in colour. The underside of the body is greyish, becoming purply just above the legs. The head is blackish with a marked white inverted V in the front, surmounted by ochreous. These larvæ are thus somewhat different to those described in South Africa.

The pupa is variable, either white, buff, or grey, ornamented with the usual blackish stripes on the thorax and wing-cases and spots on the abdomen. They have no characteristic spines or projections.

Distribution:

This Acræa is widely spread from the Coast to Mt. Kenia, and westward to about Lumbwa where it meets with the Uganda form.

Specimens from Nairobi show a decided intermediate pattern between the northern race *abadima* and the form from Dalgube.

It is everywhere fairly abundant and it is not difficult to capture. The flight is slow and gliding, and this adds to the insect's conspicuousness.

46. *ACRÆA NATALICA ABADIMA*, Rib. = clarei, Neave, Syn. Pl. III., figs. 1—9. Pl. IV., figs. 3—5, 10.

Expanse, 56-70 mm. General colour reddish-orange with semi-transparent tips to fore-wings.

F.w. Orange-ochreous or pinkish-orange, very thinly scaled, with a semi-transparent sub-apical patch which has a greyish appearance; apex black, costa and margin narrowly blackish; a series of orange sub-marginal spots from Ib to 4. Other f.-w. spots are as in the typical form.

H.-w. rosy-orange or rosy-red, with slight blackish basal suffusion, indistinct spots, and with a very narrow marginal blackish band carrying indistinct arches.

Underside: F.-w. glazed and with little scaling except towards the margin and apex, which carry orange internervular rays.

H.-w. ochreous-pink with black spots as in typical race; marginal border a series of blackish arches enclosing ochreous spots. Terminal two-thirds of abdomen above, white or pinkish.

There is very much less variation in this race than in the southern form but two varieties are fairly constantly found; (*a*) one in which the external half of the fore-wing is thinly scaled with blackish so that with the black apex the outer half of the wing appears very dark; (*b*) a variety in which the fore-wing is almost uniformally scaled and of a lighter orange-ochreous colour than normal. Furthermore the basal suffusion in both fore and hind-wings is reduced and the hind-wing marginal border reduced to a mere trace.

Female:

The variation in this sex is considerable, the commonest varieties are as follows:—

(*a*) A form somewhat like the male but with the fore-wing more suffused with blackish and with the ground colour richer; with a hind-wing patch rather more rosy, but both the basal and marginal black more extensive. (Pl. III., fig. 5).

(*b*) a variety in which the blackish suffusion is greater in the hind-wing but less in the fore-wing, while in addition there is a pale ochreous sub-apical bar in the fore-wing. (Pl. III., figs., 6 and 7).

(*c*) Somewhat like (*b*) but with the pinkish orange areas replaced with white, so that the hind-wing patch is conspicuous. (Pl. III., fig. 4). A modification of this is seen in fig. 8 where the whole surfaces of both fore and hind-wings are suffused with greyish-brown.

(*d*) This form is somewhat like a variety of male in having the fore-wings scaled in the sub-apical area, the whole ground colour being ochreous, while that of the hind-wing is salmon-pink or shell-pink with very faint indications of marginal arches. (Pl. III., fig. 9).

Early Stages:

These are in most respects similar to the southern form but the larvæ have longer spines but less distinct dorsal stripes.

Distribution:

Through Uganda from Toro to Elgon and South to Nandi and Lumbwa. They are particularly plentiful along the forest roads of Busoga and Kaimosi. The males swarm at the roadside puddles and on damp mud. The flight is slow and flaunting.

47. *ACRÆA ASBOLOPLINTHA*, Karsch. Pl. V., figs. 1, 2, 8, 9. Pl. VI., fig. 2.

Expanse 50-60 mm. General colour blackish-brown and red.

F.-w. Sepia-brown with a small patch of brick-red on the hind-margin, usually confined to Ia, but sometimes extending up into the cell. Spots indistinct. (See underside).

H.-w. ground colour brick-red, with a very narrow black marginal border and blackish suffusion at base. Spots distinct but small. Hinder half of dorsum of abdomen brick-red.

Underside: F.-w. pale brown shading to orange at outer edge and apex. Spots as follows:—One in cell; two in discocellulars; a row of five just beyond apex of cell; one in 2; two in Ib, sub-basal

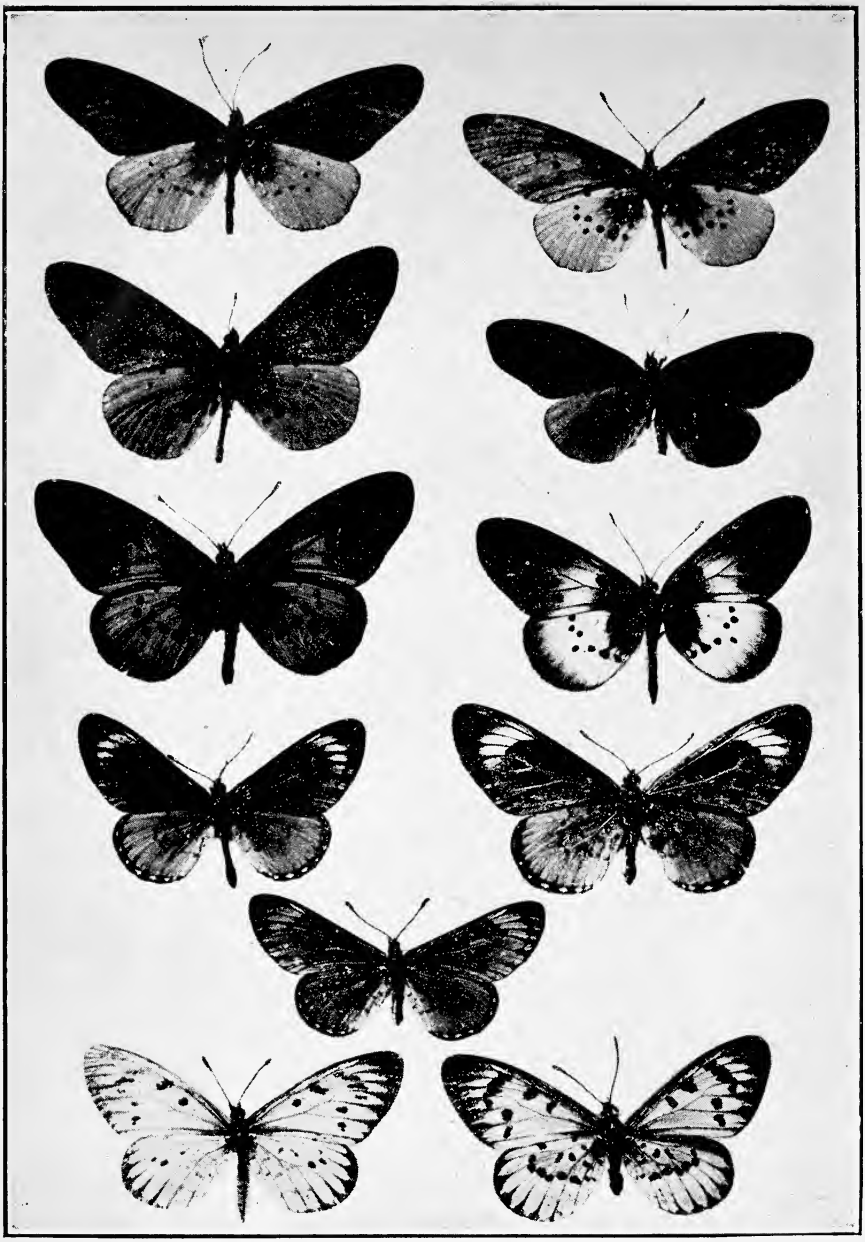

Photo: V. G. L. VAN SOMEREN.

Upper surfaces.

Fig. 1. Acræa asboloplintha asboloplintha. (Male). (Elgon).

Fig. 2. Acræa asboloplintha asboloplintha. (Male). (Kaimosi).

Fig. 3. Acræa asboloplintha rubescens. (Male). (Nairobi).

Fig. 4. Acræa wigginsi. (Male). (Kitosh).

Fig. 5. Acræa rahira. (Male). (Eldoret).

Fig. 6. Acræa rahira. (Female). (Eldoret).

Fig. 7. Acræa rahira. (Female). (Eldoret).

Fig. 8. Acræa asboloplintha asboloplintha. (Female). (Elgon).

Fig. 9. Acræa asboloplintha asboloplintha. (Female). (Elgon).

Fig. 10. Acræa asboloplintha rubescens. (Female). (Meru).

Fig. 11. Acræa wigginsi. (Kitosh).

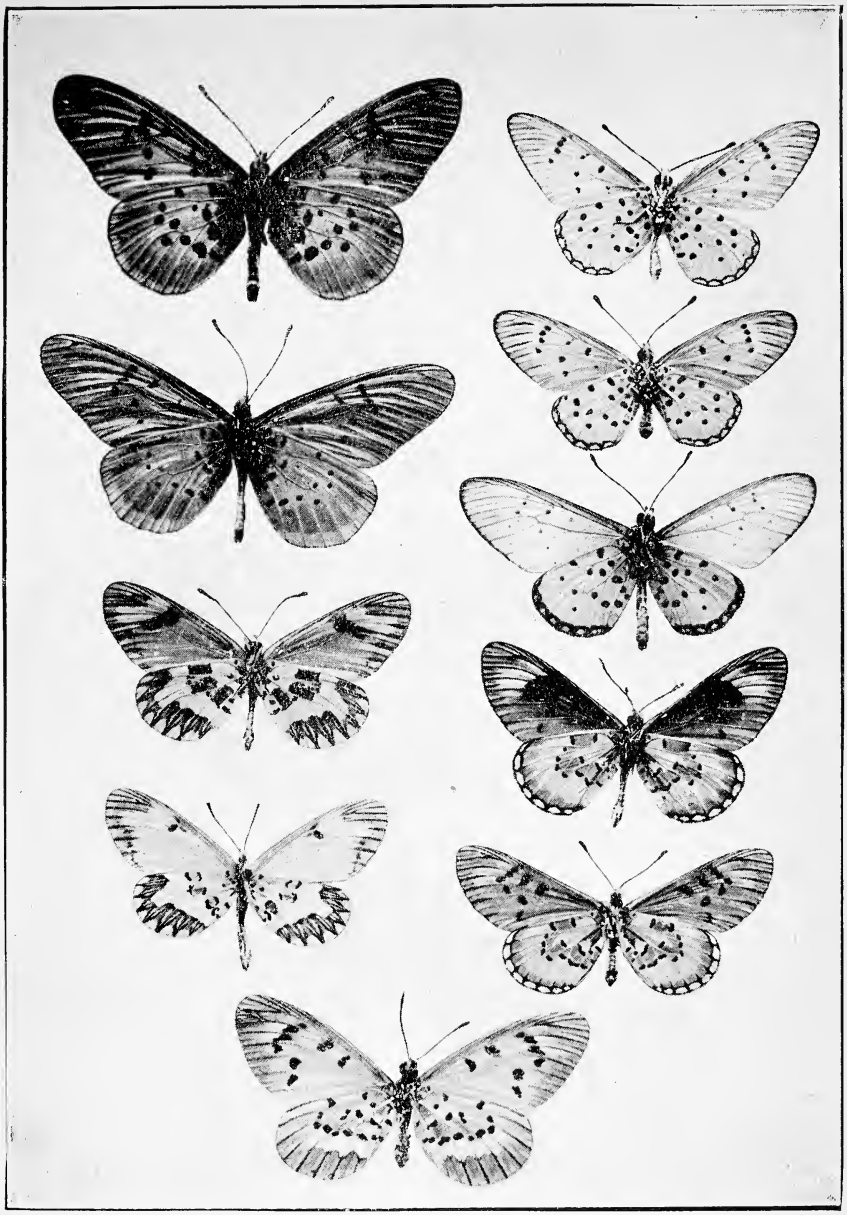

Photo: V. G. L. VAN SOMEREN.

Under surfaces.

Fig. 1. Acræa asboloplintha rubescens. (Male).
Fig. 2. Acræa asboloplintha asboloplintha. (Male).
Fig. 3. Acræa ventura. (Male).
Fig. 4. Acræa ochrascens. (Male).
Fig. 6. Acræa æquatorialis. (Male).
Fig. 7. Acræa æquatorialis. (Female)
Fig. 8. Acræa æquatorialis anæmia. (Male).
Fig. 9. Acræa wigginsi. (Male).
Fig. 10. Acræa rahira. (Male).

Fig. 11. Acræa rahira. (Female).

and central; H.-w. generally ochreous with an orange sub-marginal border; basally and inner margin in Ia, red. Spots as follows:— One in cell; two in 8; two in 7, sub-basal and mid; one each in 6 and 5, slightly internal to mid-point; one basal in 4; one each in 2 and 3 sub-basal; two each in I a, Ib, Ic, sub-basal and central. Base of wing black with white spots.

FEMALE:

Two main forms occur; (*a*) like the male but not so dark sepia on the fore-wing, but spots more distinct; with a hind-wing of a paler red and more pronounced spotting; (*b*) a form in which the hind-wing is entirely suffused with sepia-brown almost obscuring the reddish ground colour.

EARLY STAGES:

The eggs are laid in groups on the undersurfaces of the leaves of a creeper, closely allied to the food plant of *A. natalica*. They are creamy in colour, and arther strongly ribbed. The larvæ are black in the first two stages but develop a narrow orange dorsal line and orange spiracular spots in the two last instars; many examples are purply-brown above but all have the underside white or creamy. The head is black with an ochreous inverted V. The spines are short, heavily branched and black in colour. The larvæ are gregarious.

The pupa is of the usual shape. In colour it is brown or pale greyish-green on the wing cases, while the abdomen and thorax are pinkish-grey. There are two orange lines dorsally and ventrally. The spiracular spots are black. The wing veination is fine.

DISTRIBUTION:

The typical race ranges through Uganda eastwards to Mt. Elgon and Teriki and South to Mau, where it meets the Kenya form.

48. ACRÆA ASBOLOPLINTHA RUBESCENS, Trimen. Pl. V., figs. 3 and 10. Pl. VI., fig. 1.

Expanse, 55-63 mm. General colour very like the typical form but red areas more rosy and more extensive in the fore-wing, reaching well into the cell; occupying the central area of Ia and Ib, the base of 2 and the apical half of the cell. Spots clearly defined in both wings. The hind-wing is richer red, and the marginal border somewhat wider.

The female has the same pattern as the male but the red areas are replaced by white, and the hind-wing border is wider. A variety of female has the hind-wing patch pink bordered with red, while the fore-wing light area remains white.

Underside as in the typical form but more brilliant.

EARLY STAGES:

As in the typical race, but the larvæ are more purply-brown.

Distribution:

Mt. Kenia to Fort Hall, Escarpment and Nairobi. (Rare in the last).

49. ACRÆA ANACREON BOMBA, Gr. Smth. Not figured.

Eltringham records this race from Mombasa, and we would refer the serious student to this authority's Monograph for a description of this race and also of the following:—

50. ACRÆA ANACREON ANACREONTICA, Gr. Smth. Not figured.

Distribution:

"Nandi and W. slopes of Mt. Kenia."

This species would appear to be rare in Kenya as we are unable to obtain specimens locally for detailed description.

51. ACRÆA RAHIRA, Boisduval. Pl. V., figs. 5—7. Pl. VI., figs. 10 and 11.

Expanse 35-45 mm. General colour rich orange with black margins.

F.-w. rich orange paling towards the sub-apical area; costa black; apex black, broken by a series of orange rays; margin narrowly black, with an extension of this colour in graduated form along the veins.

Black spots as follows: A large one towards the apex of cell; a wedge series on discocellulars followed by a series of four in a straight line beyond the cell; one each sub-basal in 2 and 3 set at an angle to those above; a crescentic spot submarginal in Ib; a black streak at base of wing at hind margin.

H.-w. rich orange with narrow black marginal border carrying white or orange yellow spots and with the black extending slightly up the veins. Spotting obscure, but there are two black streaks at the base of the wing.

Underside: F.-w. dull orange paling outwardly; margin and apex orange-yellow, broken by black graduated rays along the veins; spots as above.

H.-w. pale ochreous distally margined with orange; marginal border black with large ovoid white spots filling almost the entire internervular space but accentuated by the black passing up the veins to the inner margin of the orange band. Spots arranged in an irregular pattern as follows—one sub-basal in 8; a row of five equidistant from and parallel to the margin extending from 7 to 4; followed by a series from Ib to 3 set in somewhat and at right angles to the inner margin and more basal in Ia. Parallel to these but more basal a series connected up with outer series by bright red. There is also a red area at base of wing.

Female:

F.-w. dull creamy ochreous or yellowish with spots as in the male but larger, and distinct on the upper side. Apical black more extended and carried in further as rays. H.-w. creamy-ochreous, slightly more yellowish sub-marginally, and broken up by the continuation of blackish from the margin, along the veins. Spots very large and distinct.

Underside: F.-w. pale creamy margined distally with orange rays; spots as above H.-w. ochreous, with a band of orange sub-marginally broken by black scaling along the veins. Spots as follows: An outer series extending from Ia to 5 in an almost straight line, then carried on at right angles in 6 and 7; other spots as in the male with an additional one in the cell; red areas as in the male.

A variety of female is figured on Pl. VI., fig. 10. This is very much paler than normal, and the spots on the hind-wing above are obscured.

Early Stages:

The eggs are laid on a small weed probably identical with the South African food-plant, *Erigeron canadense*. They are long barrel-shaped, slightly more bulbous at base, fluted and creamy or yellowish in colour. The young larvæ are blackish turning blackish-brown with the third moult; they are ornamented with two creamy lines, one dorsal, the other just above the legs, and between these there is a series of broken spots, one to each segment, dorso-laterally. The spines are ochreous with yellow bases. Head ochreous-yellow with an inverted V in front. Pupa creamy with black lines and dots, or brownish with little or no ornamentation.

Distribution:

This would appear to be rather a rare species which has so far only been taken in the Elgon and Eldoret areas and at Lake Narasha.

52. *ACRÆA WIGGINSI*, Neave. Pl. V., figs. 4 and 11. Pl. VI., fig. 9.

Expanse, 45-50 mm. General colour orange and sepia.

F.-w. basal half orange, becoming paler towards the hind angle and dusted with blackish just beyond the cell. Apex sepia-black separated from the dusky area by a white oblique bar which is divided up by blackish rays in 10 to 4. Costa and margin blackish, the latter with orange-yellow sub-marginal spots. Black spots as follows: One in mid-cell; a large one on discocellulars; one each sub-basal in 2-5; one crescentic sub-marginal in 10; base of wing with two black streaks. H.-w. Golden-orange shading to pale orange distally; margin black, slightly indented on inner edge with yellowish-white spots, internervular. Black spots obscured but arranged as on underside.

Underside: F.-w. very like above but paler. H.-w. ochreous; marginal band black, with very large white spots filling the whole of the internervular spaces; internally bordered by an orange band which is broken by black internervular rays from the margin. Base red; spots as follows:—A series of five following the contour of apical margin from areas 7-3; followed by a line of spots in 2-Ib. Areas Ia-Ib and 7 with a sub-basal spot; cell with one at margin of vein 6; the internal and external rows of spots connected up by rectangular patches of red. Wing fringe greyish. Abdomen greyish or ochreous along upper half.

Female:

Very like the male but fore-wing more suffused; H.-w. more distinctly spotted; larger.

Early Stages:

Unknown to us.

Distribution:

Uganda from Masindi and Toro to Nandi and Kitosh. Many examples of this species are very like female examples of *Acræa terpsichore*, and both are no doubt mimetic of *A. encedon* and *Danaida chrysippus*.

53. *ACRÆA ENCEDON, ENCEDON*, Lin. Pl. VII., figs. 1—10. Pl. VIII., figs. 1—7.

Expanse, 45-72 mm.

This is a very variable species which has several very marked forms, but none of these is limited in distribution too any one locality but never-the-less some are to be found more commonly in certain areas than elsewhere. Many intermediates occur. The typical form is as follows:—

Form *encedon*: F.-w. dull orange shading to light chestnut in cell and below costa; apex to beyond the discocellulars black, carrying a sub-apical oblique bar of white, which extends from 10, 9, 6, 5, 4, and very often continued as a spot in 3. A large crescentic or oval spot is present in the cell; a further spot in 2, followed by a sub-marginal double spot in Ib.

H.-w. tawny-orange with black marginal border, graduated at apical and anal angles. Internervular rays deeper orange, accentuated by the distal ends of the veins being blackish. Base of wing slightly dusky; spots as on underside.

Underside: F.-w. dull brown at basal half, followed by a blackish bar in discocellular area external to which is a replica of the white sub-apical area of above; apex and margin olive ochreous with orange internervular rays and blackish scaling along distal ends of veins.

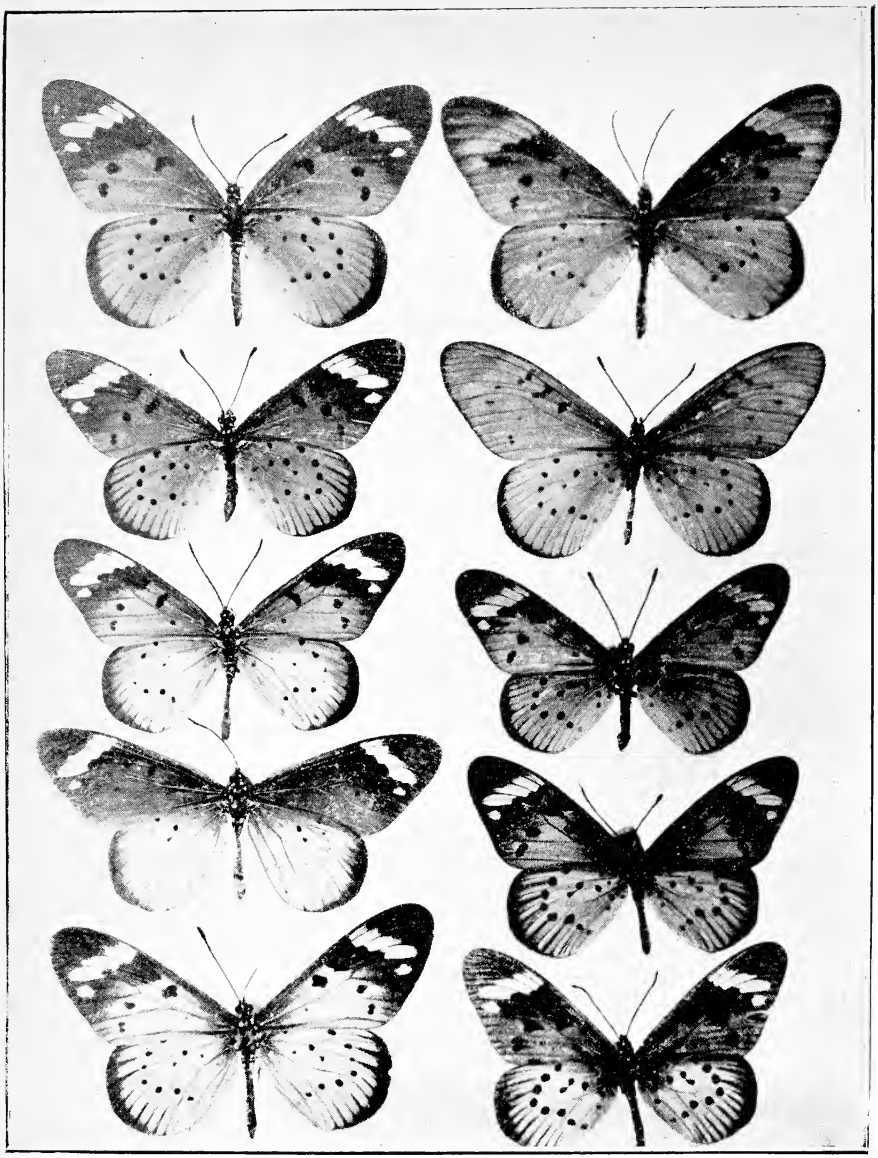

Photo: V. G. L. VAN SOMEREN.

Upper surfaces.

Fig. 1. Acræa encedon encedon.
Fig. 2. Acræa encedon (dark form).
Fig. 3. Acræa encedon f. alcippina.
Fig. 4. Acræa encedon f. alcippina.
Fig. 5. Acræa encedon f. lycia (pale).
Fig. 6. Acræa encedon (intermediate).
Fig. 7. Acræa encedon f. daira.
Fig. 8. Acræa encedon nr. necoda.
Fig. 9. Acræa encedon f. sganzini.
Fig. 10. Acræa encedon var.

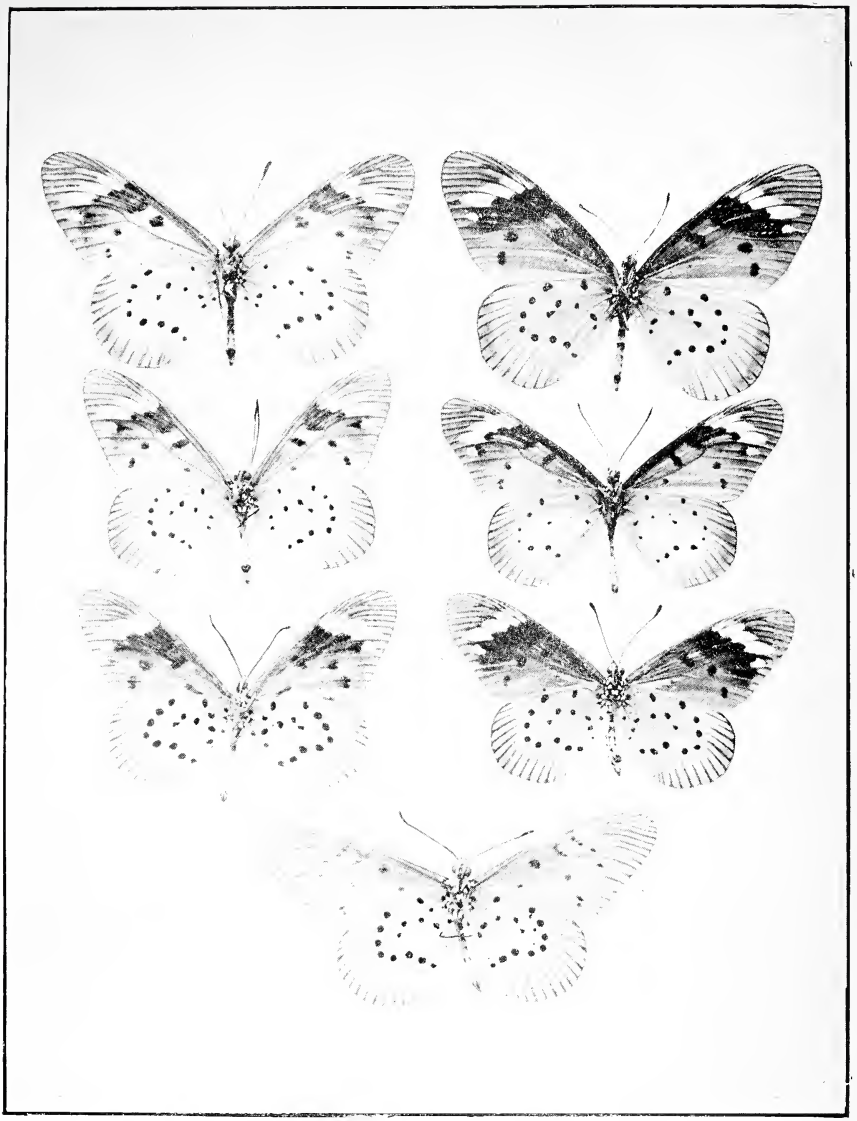

Photo · V. G. L. VAN SOMEREN.

Under surfaces.

Fig. 1. Acræa encedon f. lycia.

Fig. 2. Acræa encedon f. lycia.

Fig. 3. Acræa encedon var.

Fig. 4. Acræa encedon encedon (dark).

Fig. 5. Acræa encedon encedon (light).

Fig. 6. Acræa encedon alcippina.

Fig. 7. Acræa encedon f. daira.

Spots as above. H.-w. as above but duller; marginal border reduced to a mere line; internervular rays orange, inclining to black at marginal end; veins black-scaled distally. Spots as follows:—One in 9; two in 7, sub-basal and mid; following this outer spot, a series of 7 spots which follow the contour of the wing more or less, from 6-1b, that in the last being set slightly more marginal than the rest. Areas 4 and 5 each have a basal spot, while 1b and 1c each have one sub-basally. The cell contains one at the extreme base and one about the centre. These spots are remarkably constant and are found in all the forms.

Female:

Resembles the male, but is usually larger.

Of the various forms which occur almost throughout the entire distribution of the species, the following are figured on Pl. VII.:—

(*a*) Fig. 2. Somewhat like typical *encedon* but with a dusky suffusion over the basal brown; H.-w. generally more dusky=*f. infuscata*.

(*b*) Fig. 3. Fore-wing as in typical form but hind-wing with a large white area=*f. alcippina*.

(*c*) Fig. 4. Very like (*b*) but with a much darker fore-wing and greater area of white in the hind-wing. *c.f. Danaida chrysippus f. alcippus*.

(*d*) Fig. 6. Very like the typical form but fore-wing apex orange like the rest of the wing; sub-apical bar orange.

(*e*) Fig. 7. Somewhat like Fig. 6, but both fore and hind-wings uniform orange-ochreous. *c.f. Danaida chrysippus, f. dorippus,=f. daira*.

(*f*) Fig. 8. Resembles somewhat the typical form but ground colour pale ochreous=*f. lycia*.

(*g*) Fig. 9. Like fig. 8, but fore-wing base dusky and ground colour pale ochreous; hind-wing with marked black rays along veins and spaces.

(*h*) Fig. 10. Fore-wing smoky-ochreous with white sub-apical bar; hind-wing white with blackish rays.

(*i*) Fig. 5. Fore and hind-wing creamy-white or white; black rays marked=*f. sganzini*.

Early Stages:

The eggs are laid in bunches or groups on the leaves of two species of Commelina; they are white or cream in colour and measure 1.5 mm. in length. The larvæ are blackish in the first stage, subsequently moulting to a greyish-black with a yellow spiracular line; each segment is ornamented with two vertical yellowish lines and a central black line which carries the spines. Headpiece black with brown marks laterally. Pupa white, grey, or brown with the usual black lines and spots, with yellow or orange centres.

Distribution:

General throughout Kenya and Uganda. Frequents the open grass country and edges of forest land but seldom occurs within true forest. The greatest variety of forms are found in Uganda and Kavirondo and to a less degree at the coast, while around Nairobi district the form of *diana* is conspicuous as is to be expected being influenced by its model *D. chrysippus f. dorippus*.

The typical *encedon* form is mimetic of *D. chrysippus f. chrysippus*.

54. ACRÆA EXCELSIOR, E. M. Sharpe. Pl. IX., figs. 1 and 2. Pl. XIII., fig. 8.

Expanse 35-46 mm. General colour, orange, cream and black.

F.-w. basal half orange red, slightly paler in upper part of cell and distally; widely edged with black on costa apex and margin. Apical area with conspicuous creamy-yellow oblique bar; base of wing slighty dusky, with an extension of this colour along hind-margin. (Out of a series of over 100 topotypical males there is not one with "sub-marginal lemon-ochreous spots divided by the nervules" as described by Tltringham). Monograph of Acræas.

H.-w. Central band creamy-yellow from Ia to 3, richer yellow from 4 to costa; basal suffusion blackish and clear cut, at inner margin, more diffuse at costa; a distinct black line at discocellulars which divides into a Y at costa and encloses a red spot. Marginal border black tapering somewhat at costa and anal angle, and somewhat indented at inner edge in area 4.

Underside: F.-w. somewhat like above but paler and duller; apex and margin with deep brick-red internervular rays divided by black along the veins.

H.-w. lemon-yellow; marginal border as above but more greyish, with large triangular internervular white spots, from the apex of each is a red line which extends to the inner edge of the border; half way along the costa is an irregular black triangle enclosing a red area, the apex of which reaches to vein 4; area 9 is red. A second black triangle is situated on the inner margin, with apex at origin of V2; the triangle is divided by black lines enclosing two red spots at base of Ic and two yellow in Ia.

Female:

Very like the male; usually larger and slightly duller but ornamented along the margin of the fore-wing and hind-wing with a series of sub-marginal internervular reddish spots.

Underside: As in the male, but F.-w. internervular rays more triangular and orange in colour; the marginal spots on the hind-wing more triangular with contiguous bases, thus causing the nervular blackish rays to be pointed distally.

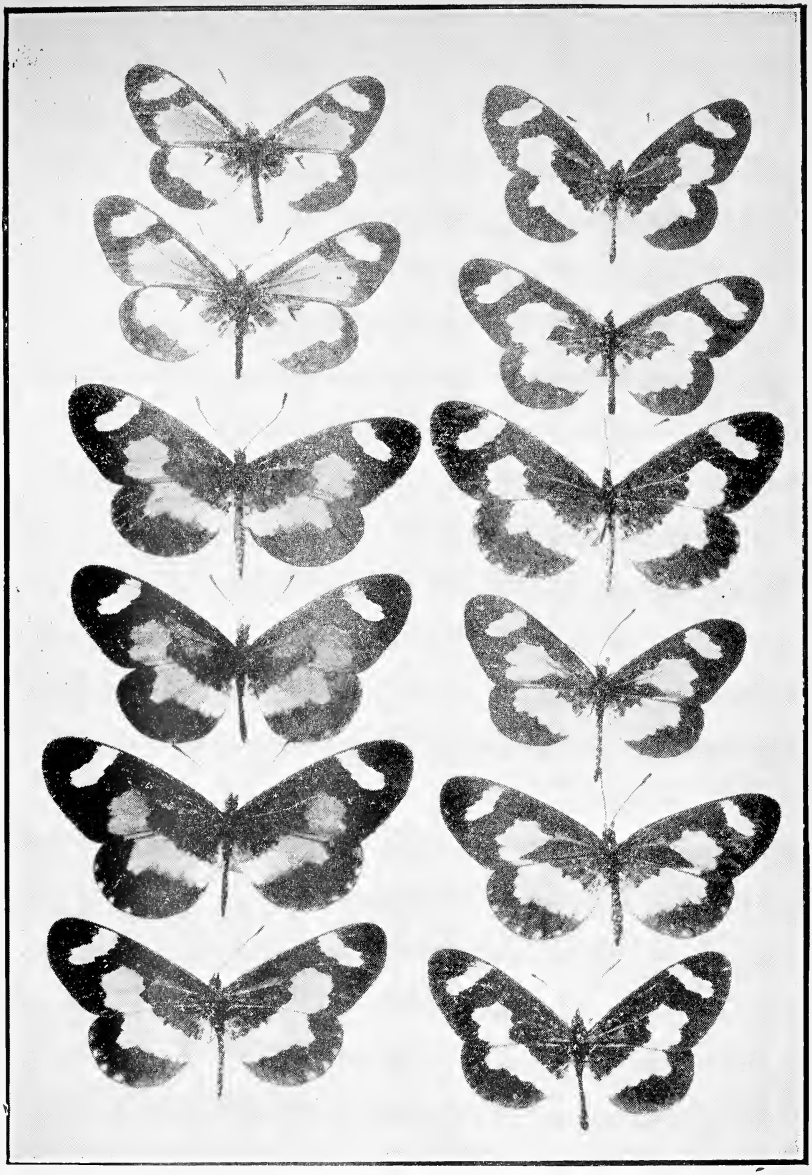

Photo: V. G. L. VAN SOMEREN.

Upper surfaces.

Fig. 1. Acræa excelsior. (Male).
Fig. 2. Acræa excelsior. (Female).
Fig. 3. Acræa sotikensis. (Male).
Fig. 4. Acræa sotikensis. (Male).
Fig. 5. Acræa sotikensis. (Female).
Fig. 6. Acræa sotikensis rowena. (Female).
Fig. 7. Acræa cabira. (Male).
Fig. 8. Acræa cabira var. (Male).
Fig. 9. Acræa cabira. (Female).
Fig. 10. Acræa cabira f. apecida. (Male).
Fig. 11. Acræa cabira f. apecida. (Female).
Fig. 12. Acræa cabira f. karschi. (Male).

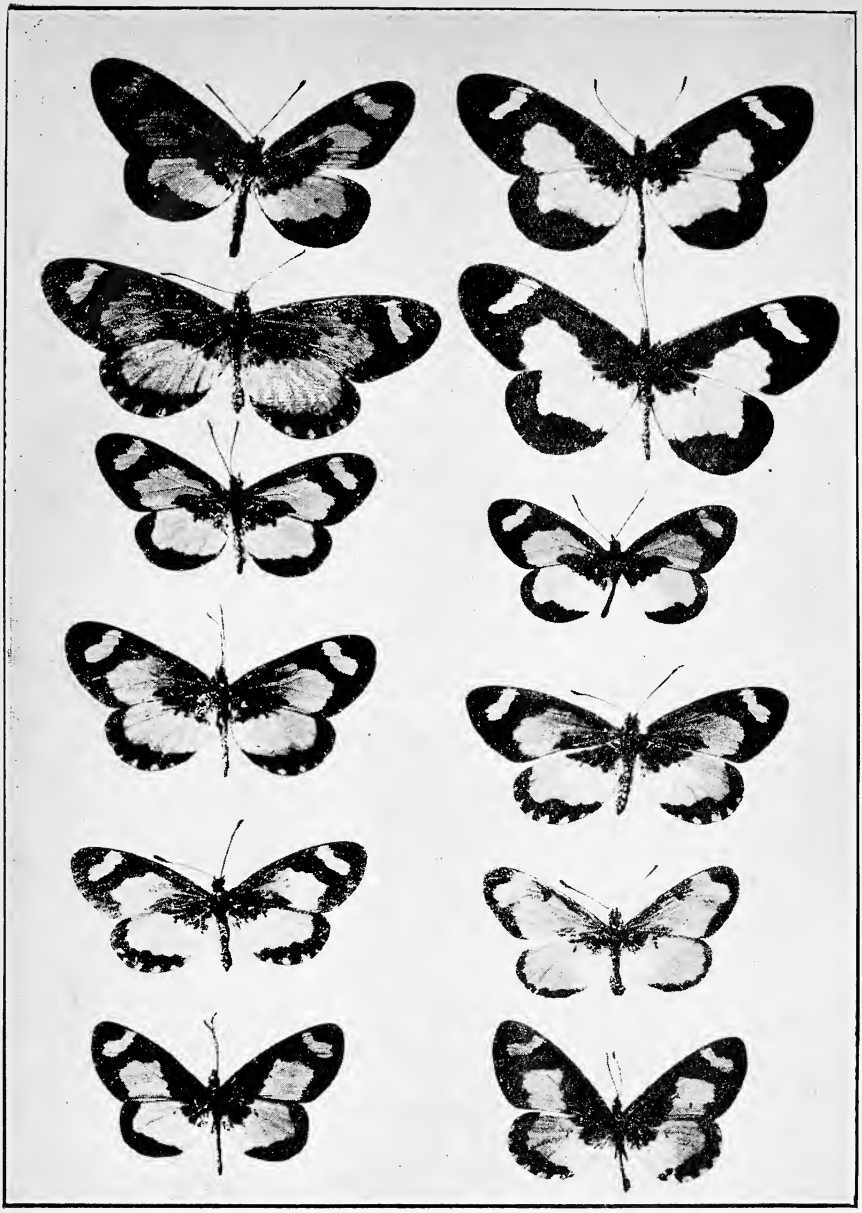

Photo: V. G. L. VAN SOMEREN.

Upper surfaces.

Fig. 1. Acræa bonasia bonasia. (Male). (Masindi).

Fig. 2. Acræa bonasia bonasia. (Female). (Masindi).

Fig. 3. Acræa bonasia alicia. (Male). (Jinja).

Fig. 4. Acræa bonasia alicia. (Female). (Jinja).

Fig. 5. Acræa bonasia alicia. (Female). (Jinja).

Fig. 7. Acræa viviana. (Male).

Fig. 8. Acræa viviana. (Female).

Fig. 9. Acræa bonasia var. (Male). (Kikuyu).

Fig. 10. Acræa bonasia var. (Female). (Kikuyu).

Fig. 11. Acræa bonasia var. (Female). (Kikuyu).

Early Stages:
Unknown.

Distribution:
Found only at high altitudes, usually above 7,000 ft. on the Escarpment, Kijabe, Aberdares. It is very local but fairly common where it occurs. It is easily recognised by its remarkable underside It has a somewhat slow flight unless disturbed.

55. *ACRÆA UVUI*, Gr. Smth. Pl. X., figs. 6 and 12. Pl. XII., figs. 11 and 12.

Expanse 30-40 mm. General colour, black and orange-red.

F.-w. black with an orange-red sub-apicalbar, narrow just at costa but expanding in areas 5 and 4, so that it has the appearance of turning up and out; occasionally the bar is almost the same width throughout.

A large almost rectangular patch of orange-red ocupies the mid-area of Ia and Ib, the basal 2/3 of 2, the base of 3 and a triangular portion of the cell.

H.-w. basal triangle black, with a slight line in 6; margin black; most of the wing occupied by orange-red shading to yellow at the inner margin and produced to an angle in 4 and 5, at which point the marginal black border is narrowest.*

Underside: F.-w. basal 2/3 tawny-yellow with a faint indication of the black above shewing through. Black areas of terminal 1/3 as above but duller at tip and margin, though distinctly black above the orange; apex and outer margin with dull orange internervular spots, sometimes distinct, often obscured. Sub-apical bar dull ochre-yellow.

H.-w. mostly ochre-yellow; marginal border black and angled as above; and decorated with conspicuous white triangular marginal spots; base slightly olive. Black spots as follows: A series of three set in a triangular fashion, sub-basal in Ia and Ib, basal in Ic; followed by two large black quadrate spots in Ic and in mid-cell; a comma mark basal in 5; directly above which is a spot in 7; a rather inconsistant series at base of 1b, Ic and cell.

Female:
Very like the male but larger, rather duller, with more yellow at inner margin of H.-w. The hind-wing margin is more uniform in width and is ornamented with orange-red spots; a few sub-marginal red spots are present at the angle of the fore-wing.

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* *A. uvui* from the high Kikuyu Escarpment appear to have developed along lines similar to the Kikuyu race of *A. bonasia*, i.e., the inner area of the H.-w. is markedly more yellow than in typical *uvui*.

Underside: Variable, though much as in the male; apex and outer margin brownish with long orange internervular rays; sub-apical bar reduced, sometimes reduced to an ochre triangular patch, base to costa. H.-w. margin wider and with larger spots; basal spots arranged in transverse row to origin of 6, with a large quadrate spot in 7. Very frequently the spots are obsolete, the whole of the ground colour being a chestnut brown, except along the cost, and area 8; the marginal triangular spots are ochreous, while the rays are indistinct. (Vide photo).

Early Stages:

The eggs are laid in a group on the underside of a leaf of a species of Hibiscus; they are creamy when first deposited but rapidly become orange, then greyish just before the larvæ hatch. The larvæ are gregarious and like many other species of acræas of this group they spin a web between the skeleton of the leaf on which they are feeding, so that when all the fleshy substance has been devoured the leaf hangs in a web-covered mass, and into this the young larvæ retire when not feeding. The mature larva is brown with a lighter dorsal stripe, an interrupted dorso-lateral line, followed by a yellowish side line above the legs. The spines are mostly black except those on the lower thoracic area which are brownish or ochreous. The pupa is white or creamy with fine black lines on the wing-cases, and the usual spots with yellow centres on the abdominal segments; frequently the pupa may be uniform bronzy-golden.

Distribution:

Through Uganda to Nandi and Escarpment, east to Mt. Kenia at Meru and Embu. It is very common where it occurs, the males far out-numbering the females. This species flies with *A. bonasia alicia*, and may easily be mistaken for that species on the wing. The most marked difference is in the basal black of the hind-wing which in *uvui* is in a line with the black of the fore-wing.

It is found in the vicinity of forest clearings and along roads traversing forest, and is seldom taken out in the open.

56. *ACRÆA BONASIA BONASIA*, Fab. Pl. X., figs. 1 and 2. Pl. XII., figs. 2 and 3.

Expanse 40-48 mm. General colour orange-red and black.

F.-w. black, with a sup-apical oblique orange-red bar; and a large area of the same colour occupying the lower half of the cell, entering base of area 3, basal 2/3 rd. of 2, except at angle, the outer half of Ib except at margin and the outer half of Ia, except marginally. The black at the base of the wing is thus cut into, especially by the red in the cell. H.-w. basal triangle blackish; margin broadly black, indented on the inner edge by an extension of the orange of the rest of the wing in areas 4 and 5.

Underside: F.-w. dull orange-tawny at basal half to almost the apex of the cell, which contains a black streak; directly beyond the cell is a black bar, wide at the costa and narrowing as it crosses 3 and 4; a subapical bar of ochreous-yellow corresponds in outline to the orange bar of the upper surface. Apex and outer margin brownish-black with triangular ochreous internervular spots; the veins carrying a certain amount of ochreous dusting.

The bases of areas Ib and 2 contain blackish spots.

H.-w. ochreous-yellow in mid area, slightly tinged olive at base; the two colours being separated by a series of irregular shaped spots which extend in a straight row from a large spot in 7 to sub-basal spots in I a. Margina black and indented as above, and carrying seven marginal internervular triangular orchreous spots, and ornamented with ochreous above and below each vein.

Female:

Somewhat like the male but duller, more brownish-black, and paler ochreous-orange, slightly deeper in shade in the lower part of the cell.

The general distribution of colour is as in the male but the basal black of both fore and hind-wing is less extensive and not so clearly defined; further the marginal band of the hind-wing carries a series of triangular internervular orange spotos. In some females the sub-apical bar is yellow.

Underside: Somewhat variable; F.-w. much as in the male but duller, and with more extensive ochreous rays on the margin. H.-w. base greenish-grey, followed by an irregular row of variable spots; central area of wing ochreous largely encroached upon by the long blackish-brown rays originating from in between the marginal internervular ochreous spots.

Early Stages:

The eggs are laid on the underside of the leaves of a species of Hibiscus. The newly emerged larva is a dirty white above slightly tinged with bluish below and carries white spines. At the second moult the two or three anterior rows of spines as also the three posterior become black. In the mature stage the larva is bluish or greenish white with the dorsum, blackish and decorated with a white mid-line. A lateral body-line of yellowish extends above the level of the legs, from the third segment to the last. The anterior and posterior spines remain black. The pupa is elongate with only slight protuberances at head and thorax. The blackish pencilling may be marked or feint according to the ground colour; in the white variety these are pronounced.

DISTRIBUTION:

The western form extends into Uganda and reaches as far east as Chagwe, but it rapidly merges into the eastern race *alicia*.

Males are more noticeable than females and come readily to damp mud along forest streams and by roadsides which pass through forest land and high bush country. The flight is slow and feeble.

57. *ACRÆA BONASIA ALICIA*, E. M. Sharpe. Pl. X., figs. 3, 4, 5. Pl. XII., figs. 4 and 5.

Expanse 30-45 mm. General colour orange-red and black.

This race is very like the typical but is smaller. The black basal areas of both wings are more restricted, thus the dark colour of the fore-wing does not extend into area 2, and more than half the cell is orange-red. In the typical *alicia*, the orange of the hind-wing is only very slightly paler in the region of the inner margin, but examples from Marsabit south to Kikuyu and Nairobi have this area distinctly yellow. (Vide Pl. X., figs. 9 and 10).

Underside: F.-w. basal two-thirds orange; costa, apex and outer margin black; sub-apical bar yellow-ochre; margin with triangular internervular ochreous rays; sub-basal pinkish spots in Ia and 1b. H.-w. ochre-yellow tinged with greenish at the base; marginal border black with distinct ochre triangular internervular marginal spots. Black spots variable, but usually set in an irregular line which extends from a large spot in 7 to a double spot sub-basal in Ia.

FEMALE:

This is variable; there are three fairly well-marked forms which may be described as follows:—

(*a*) Somewnat male-like, but larger and duller; hind-wing margin with distinct orange spots. Underside generally duller than in the male, with the apex and margin more brownish and intersected by ochreous internervular rays outlined with brownish and by blackish nervular streaks. H.-w. much as in the male but marginal border brownish and less dense so that the rays are more visible. The sub-basal row of spots is more distinct and made up of larger and more coelescent spots.

(*b*) F.-w. male-like but duller, and more tawny towards base; sub-apical bar paler, H.-w. ochreous, shading to orange towards costa; marginal spots ochreous. Underside: Paler and duller than in (*a*) with margin more ochreous and with ill-defined rays. H.-w. marginal border more extensive, the rays ill-defined but encroaching inwards almost to apex of the cell. Spots set as a double row transverse to the wing.

(*c*) Light areas of both fore and hind-wings ochreous, with a slight tinge of orange in the cell of F.-w. Marginal spots on

hind-wing ochreous. Underside: Generally paler; margins of both wings with ill-defined marginal spots and of a yellowish-grey colour, intersected by blackish nervular streaks. Black spots of H.-w. almost obsolete.

A fourth very interesting variety is that figured on Pl. X., fig. 11.

Upperside: Light orange, slightly dusky at base; margin and apex brown-black; costa only slightly blackish; sub-apical bar only very slightly paler than rest of wing; discocellulars with a black spot. H.-w. mostly light orange, wtih a narorw marginal border with an undulating inner edge; basal area slightly dusky; inner margin of wing yellowish.

Underside: F.-w. somewhat like the upperside but margin and apex almost uniform greyish-brown. H.-w. dull ochreous with wide marginal border of a uniform ochreous-brown. Spots absent except for three on discocellulars.

Early Stages:

Eggs indistinguishable from those of the typical form. Larva very similar to that of *bonasia bonasia*, being pale greenish-grey with dark blackish dorsum relieved by two longitudinal pale yellowish lines, with a third greenish-yellow line just above the legs, this last with two pairs of spines. The three anterior and three posterior spines are black, the remainder greenish-white. Some specimens are pale so that the dorsal stripe appears brownish instead of blackish.

The pupa is dark brown or creamy with fine lines on the wing-cases, wider ones on the dorso-thoracic area and each abdominal segment with black spots carrying yellow centres.

The larvæ of this species are gregarious, so much so that it is no uncommon thing to find larvæ of two distinct ages and undoubtedly belonging to two distinct broods occupying the same web.

Distribution:

From Eastern Uganda, east and south to Ukambani; frequenting forest areas. It is an abundant species and easily captured; its flight is slow and weak. The imagines are equally as gregarious as the larvæ and one frequently finds a hundred or more at rest for the night on a single branch.

The males have a curious habit of swaying from side to side when they first alight on a branch.

58. ACRÆA SOTIKENSIS, E. M. Sharpe. Pl. IX., figs. 3, 5, 6. Pl. XII., fig. 9.

Expanse 40-60 mm. General colour, black and orange with yellow in the forewing.

F.-w. Deep brownish-black; sub-apical bar yellow-ochre, crossing from below the costa to within 3 mm. of the margin in 4. An orange-red area extends from the central area of Ia and Ib, upwards into the basal half of 2, and frequently enters the lower part of the cell and base of 1b. H.-w. Triangular basal area blackish, sometimes shewing through. Margin widely black with a strong indentation on the proximal edge at 4.

Underside: F.-w. somewhat as above; basal half reddish orange, darker in area corresponding to dark areas of above; apex and margin orange-ochre internervular rays outlined in blackish; distal ends of veins blackish. Area Ib with a comma spot at about mid-point.

H.-w. Orange area of above represented by a pinkish-ochre patch conforming to the same outline. Base sage green with two parallel rows of spots joined together by crimson, except at margin. Basal area with three spots; margin with long internervular rays of orange arising from the apex of each triangular ochreous marginal spot; intervening areas ochreous thinly powdered with black and outlined with the same; nervures black.

FEMALE:

Very like the male but larger, and with marginal orange spots on H.-w. border; black at lower part of base of F.-w. not so extended or intense. Underside as in male.

59. ACRÆA SCTIKENSIS ROWENA, Eltr. Pl. IX., fig. 6.

Very like the typical form but with a greater amount of black in the fore-wing; and hind-wing central orange area paler on the inner margin.

EARLY STAGES:

We have no notes on this species.

DISTRIBUTION:

The typical form ranges through Uganda east and south to Lumbwa and Mau. The form *rowena* comes from the Ruwenzori area and Toro.

60. ACRÆA CABIRA, Hoppfer. Pl. IX., fig. 7, 8, 9. Pl. XIII., figs. 11 and 12.

Expanse 35-60 mm. General colour orange or ochreous and black. Variable.

(*a*) F.-w. Brown-black; a sub-apical oblique bar of pale ochre-yellow extending from 11 to 10 and widely in 5 and 4; sub-costal area red at base; lower vein of cell, base of 3, two-thirds of 2, central area Ib and Ia ochre-yellow. H.-w. base greyish-black mottled with black dots; hind border black with black streaks, slightly angled at 4 and narower from then upwards.

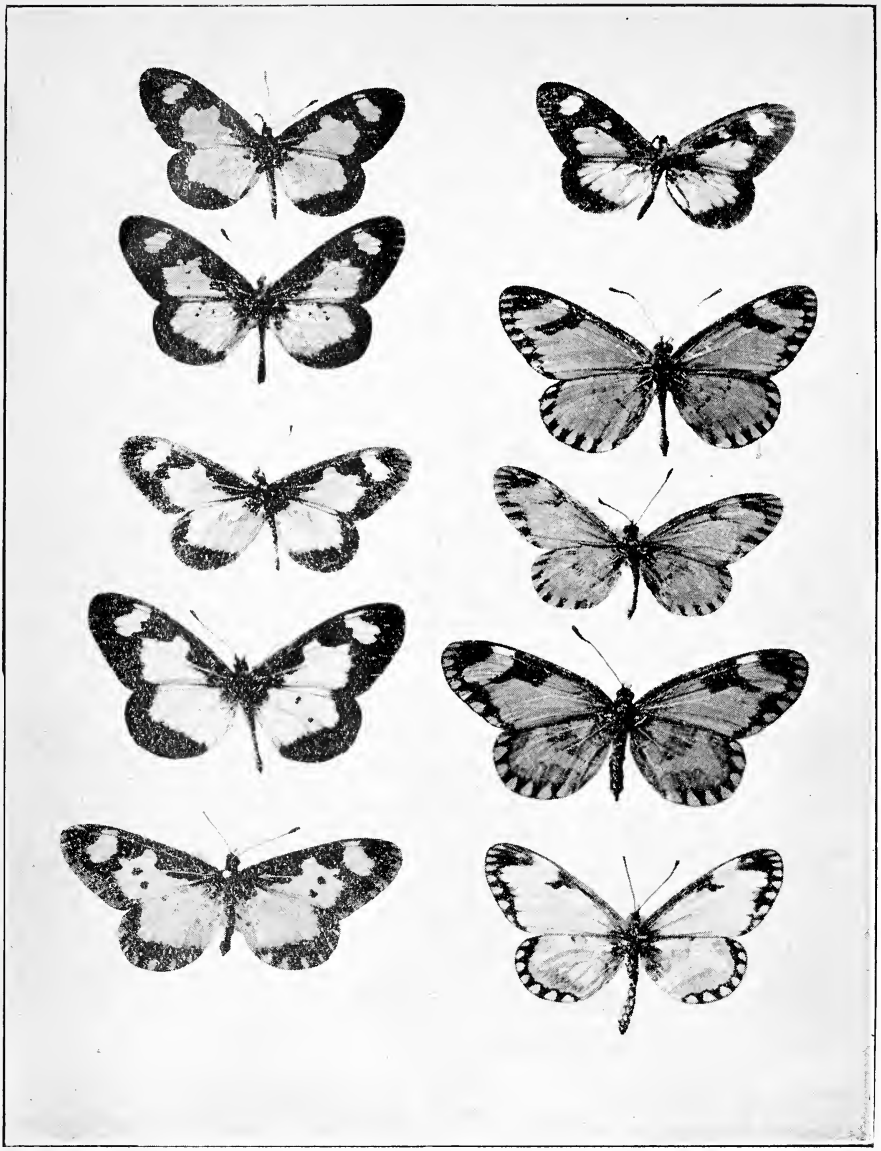

Photo: V. G. L. VAN SOMEREN.

Upper surfaces.

Fig. 1. Acræa acerata. (Male). (Meru).
Fig. 2. Acræa acerata. (Male). (Teriki).
Fig. 3. Acræa acerata var. (Male). (Nairobi).
Fig. 4. Acræa acerata f. tenella. (Male).
Fig. 5. Acræa acerata. (Female).
Fig. 6. Acræa acerata var. (Male). (Chagwe).
Fig. 7. Acræa ventura. (Male).
Fig. 8. Acræa ventura var. (Male).
Fig. 9. Acræa ventura. (Female).
Fig. 10. Acræa ochrascens. (Male). (Entebbe).

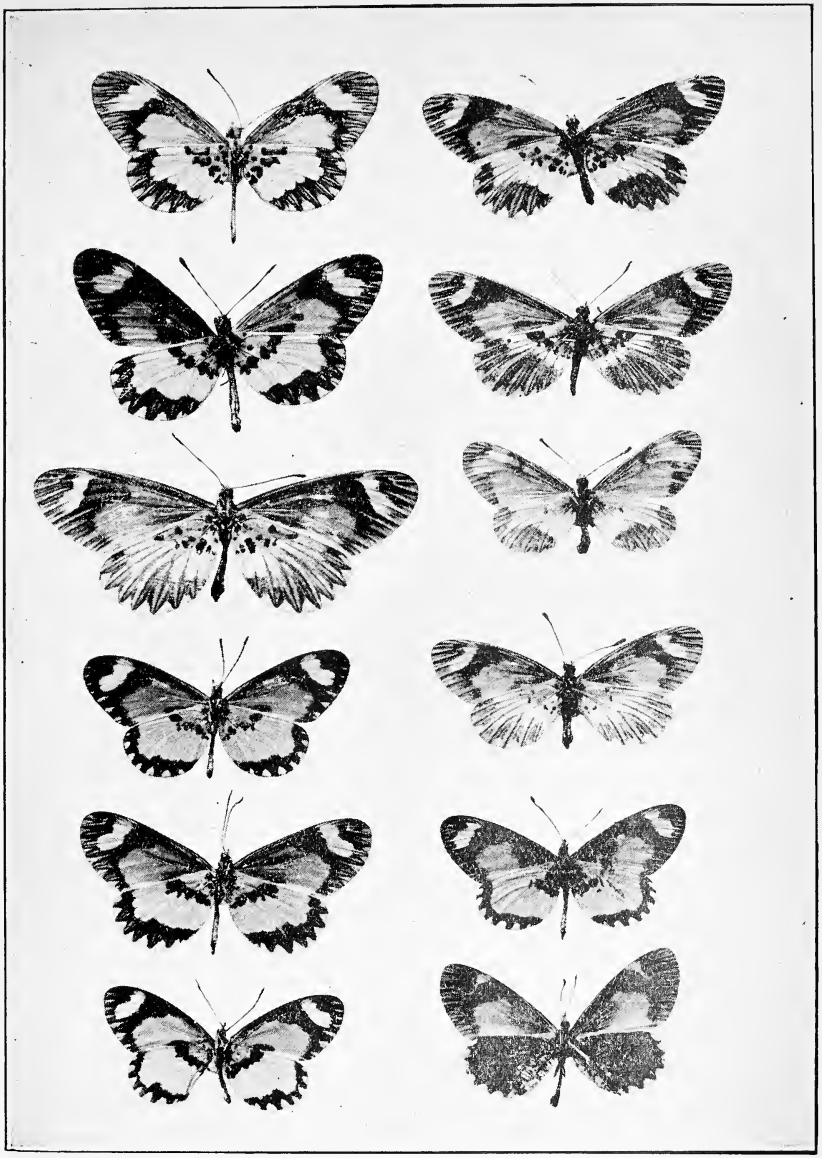

Photo: V. G. L. VAN SOMEREN.

Under surfaces.

Fig. 1. Acræa cabira apecida.
Fig. 2. Acræa bonasia bonasia.
Fig. 3. Acræa bonasia bonasia.
Fig. 4. Acræa bonasia bonasia.
Fig. 5. Acræa bonasia bonasia.
Fig. 6. Acræa var. (Kikuyu).
Fig. 7. Acræa bonasia var.
Fig. 8. Acræa bonasia alicia.
Fig. 9. Acræa bonasia var.
Fig. 10. Acræa alicia.
Fig. 11. Acræa uvui.
Fig. 12. Acræa uvui.

The following varieties occur:—

(*b*) A common form in Teita, has all the pale areas orange-ochreous, thus agreeing somewhat with the named form—*apecida*, Oerth. Pl. IX., figs. 10 and 11.

(*c*) A further form has the central ochreous patch of F.-w. stopping short of the cell, but the lower edge of the basal part of the cell is orange-red, but not connected with the ochreous of the rest of the wing.

(*d*) A variety which has the pale areas of fore and hind-wing pale ochreous and very narrow, that of the fore-wing extending towards the base; no red at base of fore-wing =*f. karschi*, Auriv. Pl. IX., fig. 12.

(*e*) Another form is somewhat like *karschi*, but the pale bands are wider and the fore-wing pale patch does not enter into the base of the wing as in the typical form.

Underside: F.-w. base dull orange shading to orange-ochre, outlined with blackish at costa and distally. Sub-apical bar ochreous; apex and margin marked greyish rays outlined with black and containing the distal black ends of the veins; internervular spaces orange. Black spots sub-basel in Ia and Ib. H.-w. greenish-ochre at base followed by a double row of spots connected up by crimson bars; centre of wing ochre-yellow widest at 4. Border with marked rays as in fore-wing but internervular triangular spots distally ochreous shading to red between the rays.

In the form *karschi*, the base of the fore-wing is reddish-brown, sharply cut from the ochreous colour of the rest of the base, and contains three distinct spots, one in cell, one basal in Ib and one sub-basal in Ia. The hind-marginal band is darker.

In the form *natalensis* the pale areas are more yellowish.

Female:

Somewhat like the males but larger, and with a distinct row of marginal orange or yellow spots in the hind-wing.

Early Stages:

The eggs are whitish-cream or ochreous and are laid in groups on a species of wild Hibiscus. The mature larva is bluish-green except for the first four segments, which are ochreous, with a dorsal and two dorsolateral lines; undersurface greenish; spines ochreous except for first two and last two, these are blackish. They are gregarious. The pupa is creamy-white or ochreous with distinct ornamentation, in the form of blackish lines and spots with orange or yellow centres.

Distribution:

This species occurs in its various form from Teita and Ukambani north to Elgon and Kenia and West Uganda. It is common where it occurs. A form has been described from the Sesse Islands under the name *abrupta*, Grunberg. It is said to differ in having no striations on the margin of the hind-wing on the underside, the border being black with whitish marginal spots.

61. ACRÆA VIVIANA, Staud. Pl. X., figs. 7 and 8. Pl. XIII., fig. 10.

Expanse 45-60 mm. General colour pale ochreous with black border.

F.-w. Black or brownish-black; sub-apical bar ochreous, rather narrow and almost uniform width, though somewhat irregular. Central pale area ochreous and large; extending through the extreme base of 3, basal half of 2, mid-area of Ib and practically all Ia. Costa red at base.

H.-w. with slight basal triangular black area somewhat spotted; pale area wide and acutely angled in 4; margin wide and black.

Underside: Entire base of F.-w. brick-red, rest of pale areas ochreous; costa broadly blackish-brown, the black colour extending between the sub-apical bar and the central pale area. Apex and margin with long ochreous internervular rays separated by nervular rays of greyish outlined in blackish. H.-w. greenish at base and separated from the rest of the ochreous pale central area by a double row of black spots which are united in the cell and area 7 by crimson bars. Marginal border with well marked ochreous triangular spots, at the apex of each a red line separating the nervular greyish rays which are outlined with blackish.

Female:

This may be a large replica of the male or more usually it is very much paler in colour.

Early Stages:

Unknown.

Distribution:

Through Uganda to Mt. Elgon and N. Kavirondo.

62. ACRÆA ACERATA, f. VINIDIA, Hewitson. Pl. XI., figs. 1—6. Pl. XIII., figs. 7 and 13.

Expanse 35-44 mm. General colour orange with black outline.

F.-w. black, sub-apical bar irregular in outline, extending from 10 and 6-4; pale orange patch in wing occupying central area Ia, Ib, and basal two-thirds of 2, extreme basal angle of 3 and slightly into cell as a wedge opposite and above vein 2; areas 2 and Ib each with

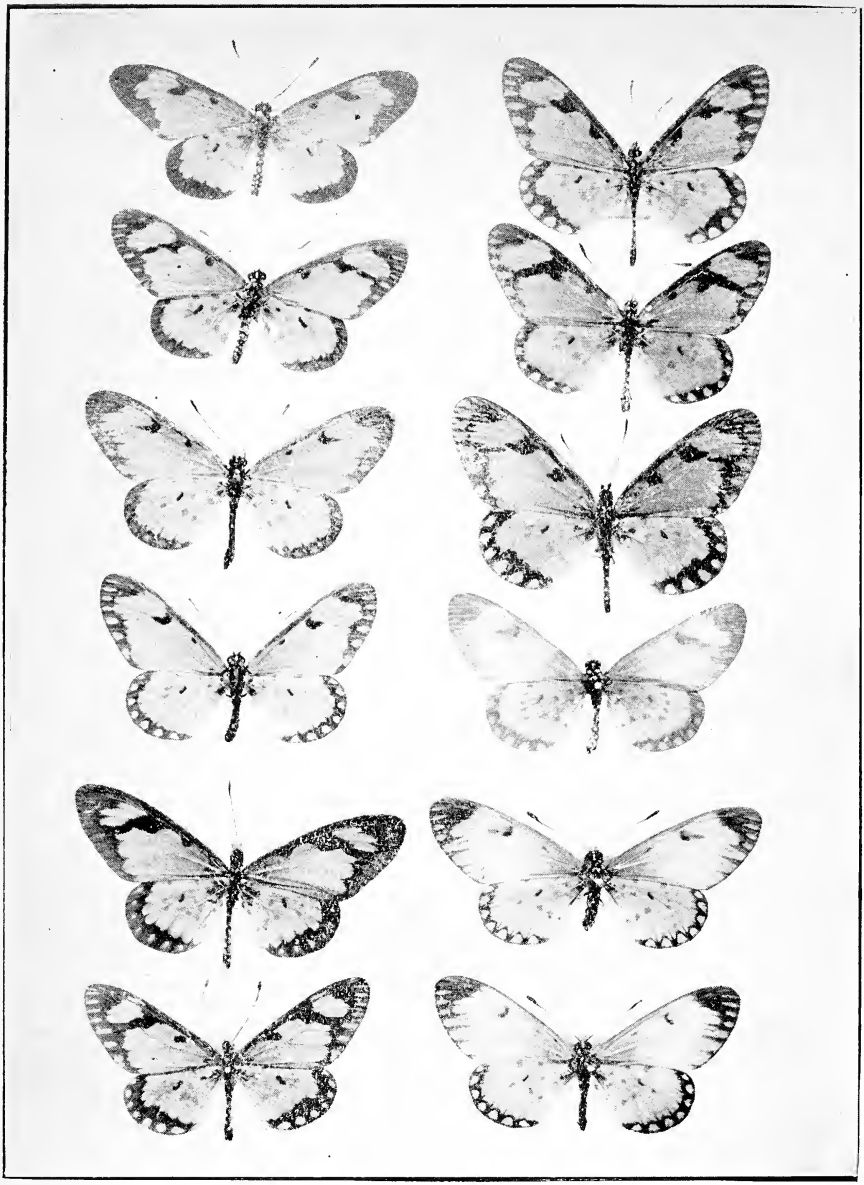

Photo: V. G. L. VAN SOMEREN.

Upper surfaces.

Fig. 1. Acræa terpsichore. (Male). (Mombasa).
Fig. 2. Acræa terpsichore. (Male). (Mombasa).
Fig. 3. Acræa terpsichore. (Male). (Mombasa).
Fig. 4. Acræa terpsichore. (Male). (Nairobi).
Fig. 5. Acræa terpsichore. (Male). (Marsabit).
Fig. 6. Acræa terpsichore. (Male). (Elgon).
Fig. 7. Acræa terpsichore. (Bugalla).
Fig. 8. Acræa terpsichore. (Bugalla).
Fig. 9. Acræa terpsichore. (Bugalla).
Fig. 10. Acræa terpsichore. (Female). (Nairobi).
Fig. 11. Acræa terpsichore. (Female). (Nairobi).
Fig. 12. Acræa terpsichore. (Female). (Nairobi).

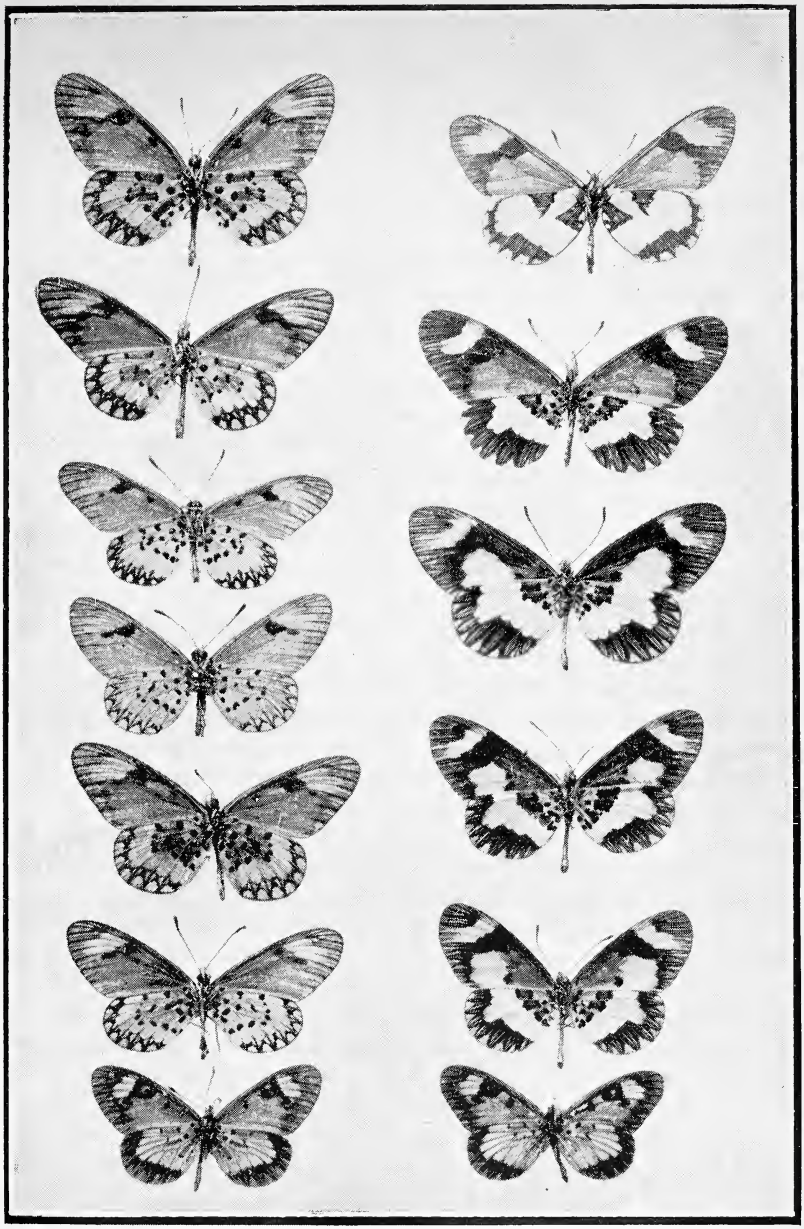

Photo: V. G. L. VAN SOMEREN. Under surfaces.

Fig. 1. Acræa terpsichore. (Male). (Bugalla).
Fig. 2. Acræa terpsichore. (Male). (Marsabit).
Fig. 3. Acræa terpsichore. (Male). (Mombasa).
Fig. 4. Acræa terpsichore. (Male). (Mombasa).
Fig. 5. Acræa terpsichore. (Male). (Nairobi).
Fig. 6. Acræa terpsichore. (Male). (Nairobi).
Fig. 7. Acræa acerata. (Male).
Fig. 8. Acræa excelsior. (Male).
Fig. 9. Acræa sotikensis. (Male).
Fig. 10. Acræa viviana. (Male).
Fig. 11. Acræa cabira karschi. (Male).
Fig. 12. Acræa cabira. (Male).
Fig. 13. Acræa acerata var. (Male).

a small black spot. H.-w. mostly orange, slightly black at base with a variable amount of spotting; marginal border black, and angled at 4.

Underside: F.-w. basally orange; a big black spot in cell; a large black patch in discocellulars, followed by a sup-apical ochreous bar. Apex and margin greyish-black with orange marginal triangles; black spots in Ia and Ib as above; cell with a black central spot.

H.-w. pale ochreous with blackish border with orange triangular marginal spots; veins slightly blackened distally. Basal spots as follows:—One spot in 8, two in 7, connected by a red line; a small spot in 2, two each in Ic and Ib connected by lines; cell with two spots, one central from which a red line extends almost to the apex, one sub-basal.

Female:

Like the male but larger and decorated with marginal spots in the hind-wing and in areas Ib to 6 in the fore-wing. Spots in Ib and 2 large, or they may be entirely absent.

A variety of male, Fig. 6, Pl. XI., has the orange areas restricted, and has the orange spot in the cell of the fore-wing quite separate from the rest of the orange area; the sub-apical bar is yellow. In the H.-w. the distal margin of the orange area is deeply dentate, and the marginal border has orange spots internervularly.

Early Stages:

Eggs are laid in bunches or groups on the undersurfaces of the leaves of a species of Solanum. The newly emerged larva is a greyish yellow or green, becoming pale greenish in the third stage, with the spines of first two and last three segments blackish or brownish; the remainder yellowish; lateral body line yellowish; head brownish with black inverted V in centre. Pupa white or creamy with usual black lines and dots.

Distribution:

Teita and Ukambani through Kenya and Uganda; frequenting the edges of forest lands and frequently occurring in the bush country. The Uganda form is a richer orange than that found in Kenya. They are slow fliers and keep low so that they are easy to capture.

63. ACRÆA TERPSICHORE, Linn. Pl. XIII., figs. 1—6; Pl. XIV., figs. 1—12; Pl. XV., fig. 1—12.

Expanse 36-50 mm. General colour of males orange to orange-red with a varying degree of black marks. Females very variable.

F.-w. orange or orange-red; costa black with a slight break before the apex; apex and margin black with a varying number of orange

spots and streaks. The cell usually has a small black spot in the upper part of mid-area, while the discocellulars carry a blackish streak which may or may not extend through area 2 and join the marginal black base of Ib with a black streak and a slight degree of blackish scaling is often present in Ia. H.-w. orange with a narrow black marginal border which is usually decorated with orange spots, but these are sometimes absent. Spots variable, the most constant being that on the discocellulars, and the one at the base of the cell.

Undersurface: F.w. orange inclining to ochre at tip and margin. The discocellular black mark is present, sometimes with a continuation into area 3. Veins 1 to 10 are usually black distally. H.-w. ochre-yellow with a very narrow black border; internal to which is a series of seven triangular ochreous spots enclosed in blackish arches, while internal to these is a series of inverted ochreous triangles divided by the blackened ends of the veins. The spotting is variable in size, though fairly constant in position, as follows:—One in 8; two large ones in 7; one each in 6, 5, 4, 3, 2, following contour of wing; two in Ic, sub-basal and central, two in Ib and Ia; a line on discocellulars; cell with one at base and one central. These spots may be detached or they may be joined up by a common brownish ground (Fig. —; Pl. —), or some may be united by red bars. Fig.— Pl. —

Females:

Extremely variable, the commonest forms being as follows:—

(*a*) Very like the male but paler and larger and less heavily marked with black, especially on the costa and margin; the discocellular mark is reduced to a spot; the spot in the cell reduced or obsolete. Pl. XIV., figs. 10, and 11.

(*b*) Like (*a*) but with fore-wing very pale ochreous, slightly browner at base; hind-wing ochreous. Pl. XIV., fig. 12.

(*c*) Somewhat like (*a*) but with heavy black apex and margin; hind-wing spots clear. Pl. XV., fig. 1.

(*d*) Ground colour as in (*a*) but sub-apical fore-wing bar white. Pl. XV., fig. 2.

(*e*) Like (*c*) but with a brown suffusion in the fore-wing; marginal black more defined and carrying spots; sub-apical bar creamy. Pl. XV., fig. 3.

(*f*) Very like (*e*) but fore-wing smoky-brownish at base; hind-wing richer orange; margin black with very small spots. Pl. XV., fig. 4.

(*g*) Like (*f*) but with no distinct fore-wing bar; orange marginal spots in fore and hind-wing defined and darker; hind-wing ground colour darker. Pl. XV., fig. 10.

(*h*) Somewhat like (*g*) but fore and hind-wings smoky. Pl. XV., fig. 11.

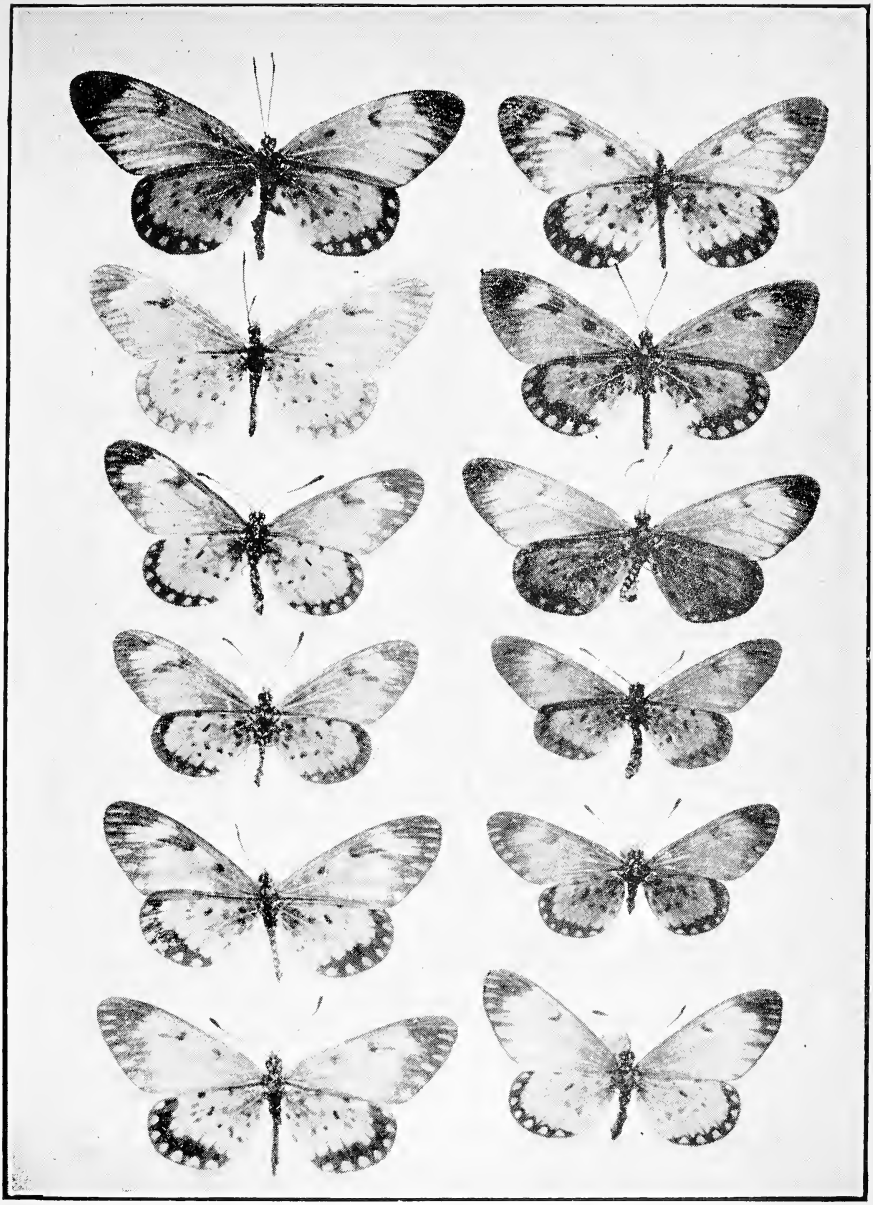

Photo: V. G. L. VAN SOMEREN.

Upper surfaces.

Various varieties of Acræa terpsichore (females).

(*i*) Very like (*f*); cell and discocellular spots large; fore-wing smoky; hind-wing orange with ochreous patch at anal angle; marginal border wide and carrying large orange spots. Pl. XV., fig. 8.

(*j*) Somewhat like (*i*); marginal spots on both wings clearly defined; ground colour fore-wing slightly paler; hind-wing ochreous-grey basally, with a distinct ochreous bar internal to the wide black marginal border. Pl XV., fig. 6.

(*k*) Somewhat like (*j*) but distal half of cell, base of 3, two-thirds 2, whole of Ib creamy, contrasting with the dark apex and marginal border; hind-wing golden orange, with a yellow bar distally with the broad marginal border. Fig. 5 and 7.

(*l*) A very curious form with deep sooty-brown hind-wing, with indistinct marginal spots; fore-wing dusky-brown at base, shading to white sub-apically and marginally; apex blackish. Pl. XV., fig. 9.

(*m*) Fore-wing creamy from costa to margin, inclining to buff at base; apex black with orange internervular rays; hind-wing orange-ochreous with narrow black border ornamented with orange spots. Pl. XV., fig. 12.

Early Stages:

The eggs are laid in groups on the underside of leaves of three species of Triumfetta. The larvæ hatch almost simultaneously and keep together until ready to pupate. They eat away the fleshy substance of the leaf so that only a skeleton is left; this is loosely woven together with silk and in this they retire when not feeding. As they grow they devour several leaves in proximity and these are meshed together to meet requirements.

When newly emerged the larvae are olive green, later they turn yellowish green; the usual form has all the spines on the first two segments black, other segments have the following: Two upper pairs, black, two lower, yellowish; each spine situated on an ochreous base; each base connected by an ochreous line. The spiracular line is more conspicuous than the others. A second variety has a dorso-lateral black line. The pupa is very variable, being either black, with a bronze sheen, the only marks visible being the abdominal rings; or golden with a distinct sheen; or almost white with little or no ornamentation; while a fourth is white or cream with bold black lines, black abdominal rings enclosing orange spots.

Distribution:

This Acræa is widely distributed through Kenya and Uganda and has several varieties which appear to predominate in certain localities, but these are not sufficiently restricted as to be

reckoned local races. Males are more constant than females; thus we find that at the Coast the prevailing form is one which has a rich ground colour with narrow borders carrying very little or no spotting. The extreme of this type is found in the Sesse Islands and along the north-west shore of Lake Victoria; this form is equally rich in ground colour but the black borders though wider are completely broken up by a series of very big orange spots. Intermediate forms are found in the Nairobi and Mau areas. The undersurfaces vary in a corresponding degree.

The species is very common and is especially plentiful in old cultivations where the food plant is abundant; it is an insect more of the open country than forestlands, but is quite common in scrub.

64. *ACRÆA VENTURA*, Hewit. Pl. XI., figs. 7, 8, 9. Pl. VI., fig. 3.

We consider it desirable for the present to treat this as a distinct species, though Dr. Eltringham suggests that it is merely a form of *terpsichore*.

Expanse, 35-50 mm. General colour, orange red with spotted black margins.

F.-w.: Almost entirely orange-red with the costa narrowly black at base but more widely bordered half way along upper side of cell; a large black spot on discocellulars is continued through area 3, and almost reaches the marginal border. Sub-apical bar orange except where it touches the costa; here it is ochreous yellow Apex and margin black with internervular rays and spots.

H.-w.: Orange-red with a slight basal suffusion of grey; marginal border black with large orange spots; the distinctive markings of the undersurface shew through the body of the wing.

Underside: F.-w. orange for the greater part, becoming paler in the sub-apical area; apex and margin orange with black on the distal ends of veins, discocellular black present but not so distinct.

H.-w. orange ochreous, margin with saggitate black lines along the veins directed outwards; ochreous along the shafts and separated from each other by quadrate red marks; between each head a triangular ochreous spot. Black spots as follows; one in 8; two transverse in 7 at about the centre and connected by a red bar, one each basal in 6 and 5, united by red barsto cell; discocellular line connected with centre spot in cell; a basal spot in 2; area one Ic black at base, with two transverse spots united by a red bar, just below origin v2; Ib with two spots; Ia one; area 9 pink. Female like the male but slightly larger, a greater amount

of black on discocellulars and apex of cell; marginal borders with larger orange spots.

A curious variety of male is figured on Pl. XI., fig. 8; in this the forewing black bar is wanting; the margins have black disconnected parallel lines so that there are no enclosed marginal spots, the internervular spaces being continuous with the rest of the ground colour.

EARLY STAGES:

Unknown.

DISTRIBUTION:

This acraea is found in greatest numbers on the high plateau of Eldoret and Lake Narasha, and again on the Sesse Islands, in this last area along wit hthe Sesse form of *terpsichore*. It is not uncommon and is easy to capture as it keeps low down and frequents low bush and grass country. It is very desirable that this insect should be bred as by so doing the relationship between this and forms of *terpsichore* would be cleared up.

65. *ACRÆA OCHRASCENS*, E. M. Sharpe. Pl. XI., fig. 10. Pl. VI., fig. 4.

Dr. Eltringham has placed this insect as a sub-species of *terpsichore*, but as it occurs along with that species it must be either a mere variety of it or a perfectly distinct species.

Expanse, 40-44 mm. General colour creamy white with black spotted borders.

F.-w. creamy white, costa brownish at base, becoming blacker up to discocellular spot, which is also black; beyond this to the apex the costa is creamy yellow; apex and outer border blackish with ochreous yellow spots.

H.-w. creamy ochreous, slightly dusky at base; marginal border blackish with large ochreous yellow spots. The undersurface pattern of the hind-wing shews through the ground colour.

Underside: F.-w. pure white or creamy white, with a replica of the upper surface pattern, except that the black on the margin is limited to disconnected nervular rays.

H.-w. creamy, with a wide marginal border deeply and abruptly indented in 5; border composed of saggitate marks pointing outward, the heads enclosing ochreous triangular spots; the shafts outlined with ochreous, with the intervening space red. Spots as follows: Area 9 pinkish; one spot in 8; two crescentic in 7; joined by a red streak; a crescentic discocellular spot joined to one of similar shape in the cell; one in base of cell; two crescentic

in Ic, joined by red; one in Ib with long axis in line with area; two in Ia.

Early Stages:

Unknown.

Distribution:

This specimen is a topotype taken by Sir Frederick Jackson at Entebbe in 1895. Apparently extremely rare.

The curious deep indentation in the hind-wing border is reminiscent of the hind-wing pattern of *ventura*, and not at all like terpsichore.

66. *ACRÆA RANGATANA*, Eltr. Not figured.

As we have no examples of this species, we give the original description:—

"Expanse 44 mm. F.-w. Cell, a small elongated spot at base of 3, basal half of 2, greater half of Ib, and central portion of Ia tawny yellow. Costa and apical half of wing sepia. The usual sub-apical patch of ground colour is reduced to three elongated pale ochreous streaks in 6, g, and 4, that in 6 being only about one-third the length of those in 5 and 4. Sub-marginal internervular spots of tawny yellow. A little black at base extending outwards along nervure I and there expanding into a small dusky spot about 5 mm. from base. A small crimson streak on subcostal near its base.

H.-w. with a little black at base, central area tawny yellow hind margin broadly sepia, deeply indented with ground-colour in areas 4 and 5. A series of sub-marginal yellow spots inclined to tawny towards apex. Inner margin paler with two dusky spots in 1a and one in Ib all more or less coalescent. The sub-basal band of red edged with black, so conspicuous beneath, is here faintly indicated.

Underside: F.-w. as above, but paler and duller, and the dark apical portion blackened only at end of cell, and along outer edge of the tawny yellow in 3 to Ia. Orange internervular streaks along the margin.

H.-w pale dull ochreous with black nervule ends and bifurcated rays enclosing red marks, the latter inwardly limiting the sub-triangular marginal spots of ground-colour. At about the level of end of cell a double row of elongated transverse black spots enclosing red, much as in *ventura*. A round sub-basal black spot in 8 and some red in 9. Some irregular black at base."

PL. A.

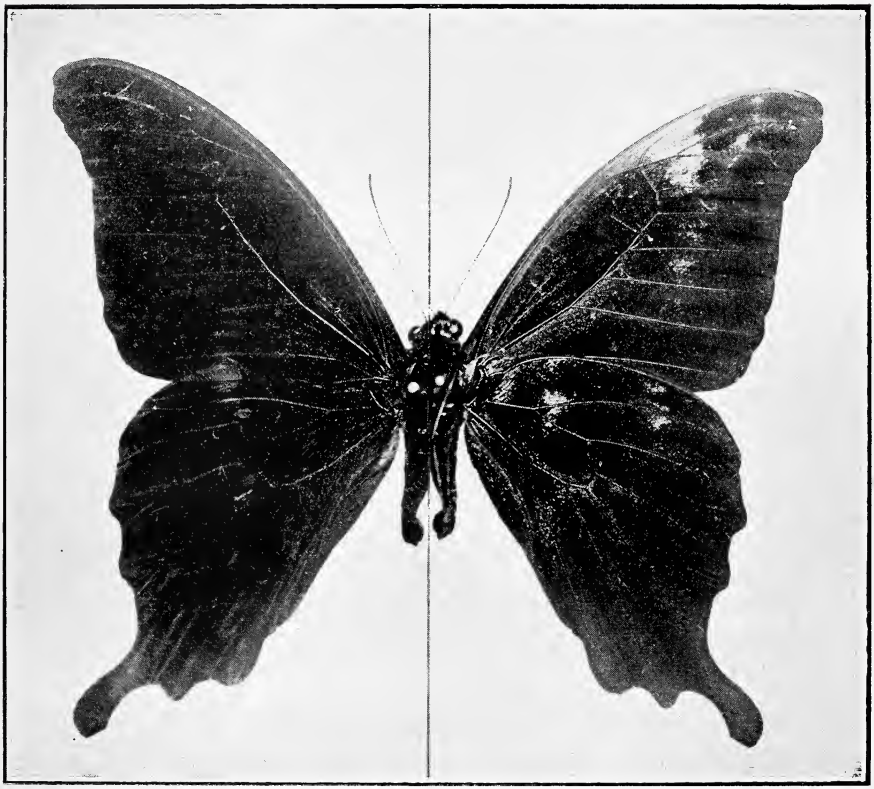

Photo: V. G. L. VAN SOMEREN.

Fig. 1. Upper surface. Fig. 2. Under surface.

Papilio mackinoni var. elgonia.
Bryk.

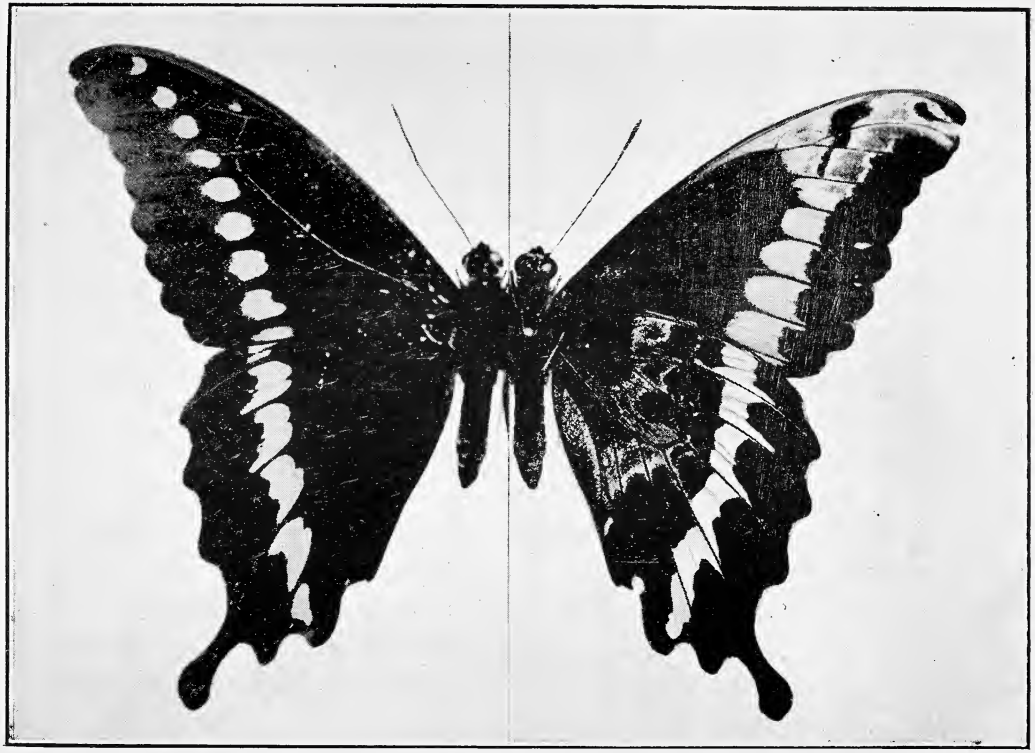

Photo: V. G. L. VAN SOMEREN.

Fig. 1. Upper surface. Fig. 2. Under surface.

Papilio mackinoni.

A MELANISTIC FORM OF PAPILIO MACKINONI.

By Felix Bryk.

Plates A. and B.

Variations in colour and form are well known in the genus "Papilio" ranging from the appearance of an additional spot or suppression of a series of spots to a complete obliteration of all marks by an encroachment of the ground colour pigmentation. The absence of all light colouration gives the insect a totally changed facies.

Such varieties occur most often in species whose ground colour is black—*viz.*, melanistic aberrations are known in *Papilio machaon* or *Papilio turnus*; but we are unaware of such having been recorded in the case of *Papilio mackinoni*.

An example of melanism in this species was collected on Mt. Elgon—altitude 8,300 ft. on March 15th, 1925, and differs so markedly from *mackinoni* as to be worthy of recognition under a variatal name—*Papilio mackinoni*, variety *elgonia*.

It will be observed in Plate A., figs. 1 and, that practically all the pale creamy spots on both the upper and lower surfaces are entirely obliterted by a heavy black pigmentatior., (Cf. Pl. B., figs. 1 and 2) and further that the serrations on the wing margins are greatly reduced.

Two other examples of this curious variety were observed on Mt. Elgon during March, 1925.

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EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY

August, 1926. *No. 26.*

CONTENTS.

THE ORIGIN OF THE MAASAI AND KINDRED AFRICAN TRIBES AND OF BORNEAN TRIBES.

By C. Cardale Luck.

Editor of Journal:
Dr. V. G. L. van Someren

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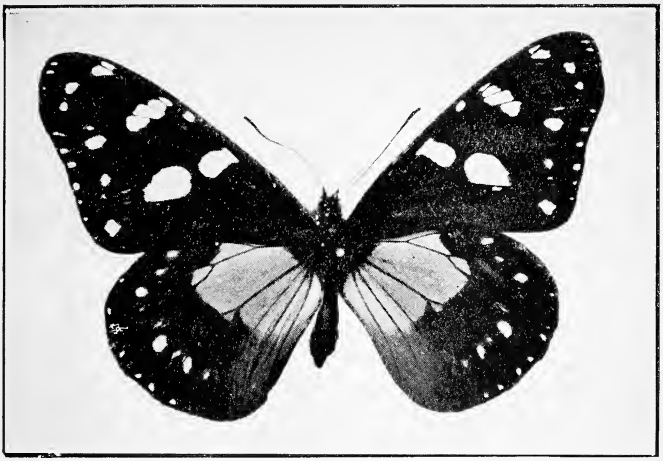
A.



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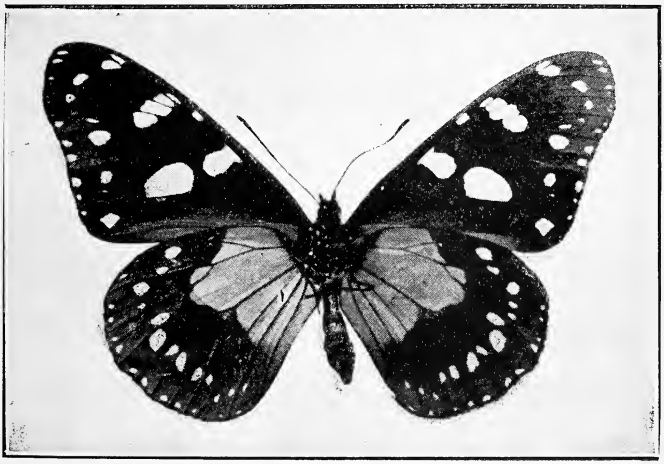

Photo: V. G. L. VAN SOMEREN.

A. Upper surface. B. Under surface.

Amauris ansorgei altumi.
van Someren.

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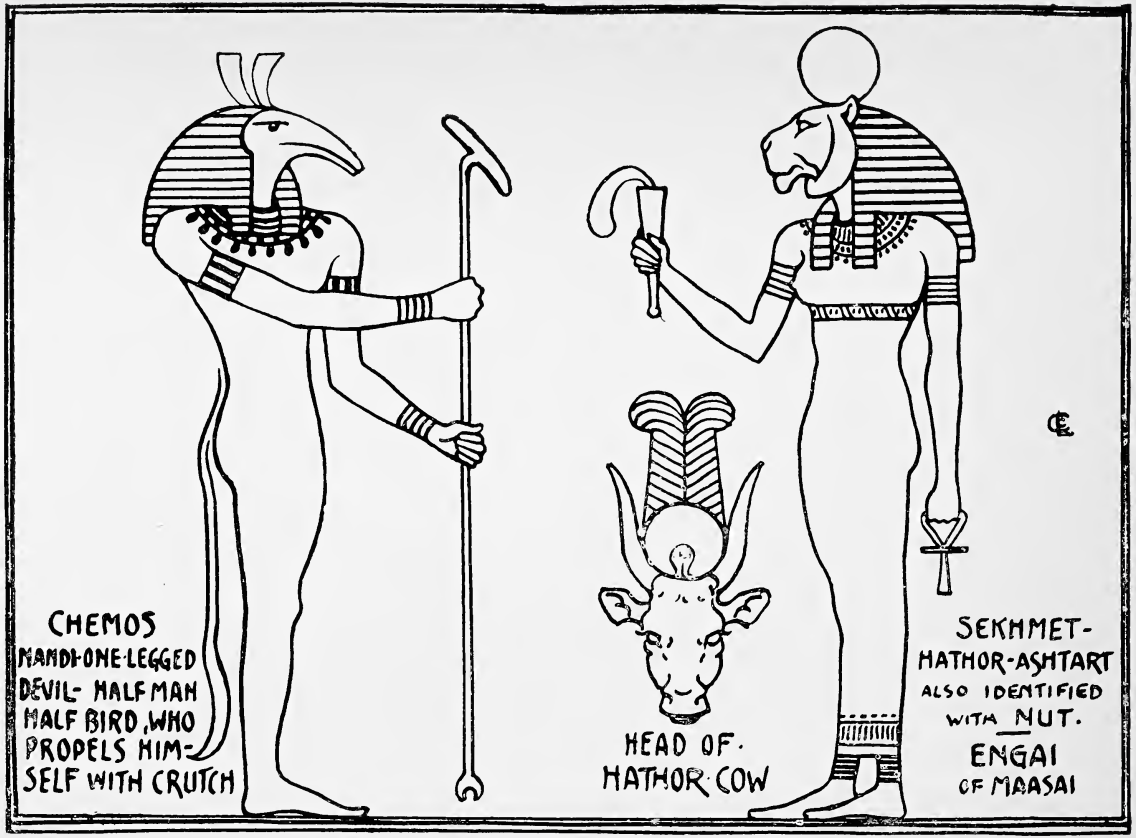
CHEMOS
MANDI-ONE-LEGGED
DEVIL- HALF MAN
HALF BIRD, WHO
PROPELS HIM-
SELF WITH CRUTCH
HEAD OF
HATHOR COW
SEKHMET-
HATHOR-ASHTART
ALSO IDENTIFIED
WITH NUT.
ENGAI
OF MAASAI

PLATE A.

PREFACE.

The research with which this review deals having been entirely carried out here in Central Africa, far away from all centres of science, the writer is only too well aware that his work must shown signs of the inadequacy of the material for reference at his disposal. He has been obliged to rely entirely on such literature as he could get out from Home, and, in this respect, being obliged for the most part to base his selection on the scanty information supplied by publishers' catalogues, he has often had many disappointments when, after months of waiting, the books eventually arrived. That in consequence certain errors may have found their way into the following pages is quite possible, but he ventures to believe that they are neither many nor of great importance to the subject as a whole.

With regard to linguistic comparisons, these have been confined within restricted limits, and the writer has only been able to make comparison with Hebrew, though possibly Aramaic and other Semitic dialects might have carried him further. As there is no Hebrew type in this country he has not been able to give the Hebrew words in their original character as he should have wished.

All the quotations from Capt. M. Merker in the following pages are translations of the writer; he is aware that it would have been more correct to have given them in the original German, but in this case they would have been of little value to the majority of the readers of this Journal in Kenya. From lack of available space, too, he is prevented in this issue from giving the original text in an appendix, for which he apologizes to the Editors of Capt. Merker's book. This and much else he hopes to rectify in an extended edition of this study which he intends to bring out in England in due course.

Not only will the present pages be revised and a considerable amount of additional evidence given, but a completely fresh section be included, dealing with the origin of the Bantu tribes of Africa—principally with the Akamba and Kikuyu of Kenya Colony and the Amazulu of South Africa—and also with the native tribes of Australia. The writer hopes to be able to show that all these people have—as he believes, in historic times—come from Western Asia. It would even seem that the different races of ancient Western Asia are as liberally represented in Australia as they appear to be on the African Continent. This work is already well under way, and should be published before many months are over.

C. C. L.

Lumbwa,
Kenya Colony,
July, 1926.

Chapter I.

INTRODUCTION.

Previous to coming to Kenya Colony, six years ago, the writer had, in connection with the study of art, taken a particular interest in Egyptian sculpture, and on arriving here was immediately struck with the strong resemblance of the natives, particularly those of the " Hamitic " group and of the Kikuyu and their fellows, to the types portrayed in Egyptian statuary. This resemblance was not merely a matter of physical types; the ornaments and, above all, the elaborate head-dresses of these tribes, seemed surprisingly similar to those of the ancient Egyptians, and his interest and curiosity aroused, after a time he began to study the matter more closely. The highly organised religious ceremonials and tribal customs and laws, so similar in many respects to those of the Mosaic code, strengthened his first impression that these people must, at some earlier period of their history, have been in very intimate touch with a higher civilisation, probably that of Egypt, and he believed at first that they were the degenerate descendants of the ancient Egyptians themselves. He seemed thus, in the different types, almost to recognise the representatives of the different periods of Egyptian history, from the coarser-featured earlier people, through the Hyksos, to the slighter and more elegantly formed Egyptians of the later Dynasties.

Little did the writer imagine, that the people of the tribe with which the following review more especially deals, and which above all others is markedly distinguished by outward signs of a possible Egyptian origin, should on closer investigation prove to be, not Egyptian, but Semites who in their passage through Egypt had adapted to themselves these unmistakeable and most striking Egyptian fashions. This tribe, the famous Maasai, is, as is known, one of a large group including such other well-known tribes as the Nandi, Lumbwa, Suk and Turkana, and also the Dinka, Bari, Latuka, and Shilluk further to the north, generally known as Nilotic or Hamitic, and if we manage to prove the origin of the Maasai, we have also succeeded in establishing, or at least hold the key that enables us to establish, the identity of these various peoples, and in all probability that of innumerable other African tribes as well.

The research that the present study comprises, was based on the theory that the order of past civilizations showed a process of continually recurring degeneration, and that this process had applied to what are commonly believed to be primitive peoples. While studying this problem, in following up culture sequence in other parts of the world, W. J. Perry's " The Children of the Sun " came into the writer's hands. On reading this very interesting work he was

struck with certain strong resemblances in the traditions of Bornean tribes to those of the Maasai, and in tracing these further, he was obliged to take up the study of these Bornean tribes in greater detail. The result is, as will be shown in the following, that it would seem possible that they have a similar origin to that of the Maasai, though they are not of the same original nation; he believes the Maasai to be ancient Israelites, and the greater portion of the Borneans to be the ancient Edomites. This disribution of Canaanitish races to such widely separated parts of the world is not very difficult to understand if we look back on history, and see what took place in western Asia from about 1,000 B.C. right into the beginning of our present era, when we shall realize how complete was the dispersal effected as the result of the great and ruthless wars of the Babylonians and Assyrians, followed by those of the Persians and others, in which, besides the barbarous treatment that was meted out as punishment in the case of opposition, whole tribes were carried away into captivity to the countries of the victors to the East, or fled in other directions before the invaders. In this way the original populations of Canaan, of Syria, and of Phœnicia were dispersed, and as the result of Semitic and Persian conquests of Egypt itself, even Egyptians were taken away into captivity into the lands of the East. If one realizes how, in the days of ancient Canaan, tribes and nations and different races lived side by side, intermingling within the same areas, yet each still keeping apart, distinct and separate from one another, we need not be surprised to see how this strong instinct for the preservation of the tribal identity, has lasted down to the present time; an instinct that will come more in evidence as greater light is thrown on the problems of racial and tribal distinctions existing over large areas of the world to-day.

In this review we give a number of traditions collected from the Maasai by M. Merker. In his introduction to A. C. Hollis' "The Nandi," Sir Charles Eliot refers to these traditions in connection with the theories held by Merker as to how the Maasai have arrived in the country of their present abode, as follows:—"Merker, and those who accept his statements, are of opinion that the Masai (and presumably with them the Nandi, Turkana, etc.) are the remains of a Semitic race which has wandered southwards from Arabia and been mingled with African elements. The chief objection to this theory is that the undisputed facts which support it are very slight, seeing that in spite of search no confirmation has been found of most of the traditions reported by Merker."* These traditions do appear almost too good to be true, but when viewed in the setting of the

* A.C.H., II., xvi.

fresh evidence of another character that we shall now bring forward they seem to take their proper place in the records of the people, who, as will be shown, have retained ancient traditions in so many other respects with a faithfulness that one would not have credited. It has been objected that these traditions may not have been of primitive origin, but are traces of Christian influences, recollections of missionary teaching at an earlier period. If this were so, it seems quite inexplicable that only Old Testament accounts should have survived, and that not one single trace of any New Testament teaching should be found, which after all would obviously have been the central point of missionary instruction. Amongst these ancient traditions of the Maasai collected by Merker, is one of their earlier neighbours the Dinet, a story which is, when considered in detail, of such unmistakeably Canaanitish origin that it should serve as evidence as to the value of the rest. In this connection we wish to give the following account of a tradition held by the Elgeyo, a tribe closely allied to the Maasai, which was given to the writer by Mr. A. M. Andersen who has worked amongst these people for some time. And this story that he gives is perhaps even more closely related to the story of Moses in the Pentateuch than any of the traditions given by Merker:—" Long, long ago, there lived an old man named Moosa. He was picked up out of a box from the water, and hid in a granary. He was brought up in the house of a great man and became a great leader. He stole the king's people, and when they came to cross the water, the water stood up on both sides, and they were able to pass over."

Merker himself tells how difficult it was to get these traditions out of the natives:—" It must further be mentioned that only after five years from the commencement of taking up this study I came on the traditions of the remote past. These are not universally spread amongst the people, but are passed down in certain families, so that even in larger Masai communities one only finds a very few old men who know how to tell them in detail. But even these few will only relate them to the seeker (Forscher) when they know him well, and know that he knows them and their mentality (Psyche) well. First, when I had got so far that the people of themselves asked if I, perhaps, was one of them from the time of their residence in the land of their origin, did I obtain any information from anyone. It took however another year and a half before I gathered the contents of the first chapter of the fourth section. I mention this here so that other seekers (Forscher), whose attention is directed to the Masai in other districts, do not get disheartened when their endeavours remain a long time without the hoped for response."*

* M.M., vi.

It is significant that the Maasi should have asked Merker if he belonged to a people who were originally of their own race (ob ich nicht vielleicht aus der Zeit ihres Aufenthaltens in der Urheimat her einiger der Ihrigen wäre); which would also imply that they know that they belong to a race which has been dispersed from the country of its origin to different parts of the world.

With regard to the importance of ancient native traditions and the difficulty of collecting them, we quote the following from Perry:—" The neglect of, or perhaps, one ought to say, contempt for, native tradition, is a marked feature of modern ethnological study. Perhaps one day someone will study the causes of this attitude towards what many of the less advanced peoples consider to be their most precious knowledge. A tendency exists, in some quarters, to look upon the savage, as he is called, as a silly child, who has made up out of his head all sorts of fancies, among them tales about his origin. This attitude is found among ethnologists, and, consequently, among those who read their writings. . . . . So long as this patronising attitude is maintained towards those who live in other places, and in different circumstances, there is not much hope for any real advance in the study of early civilization.

The members of the Polynesian Society have now spent many years in collecting and studying traditions and myths, and this is what one of the foremost of these students says:—' I would like to say, in my humble opinion the European ethnologist is frequently too apt to discredit tradition. It is an axiom that all tradition is based on fact—whilst the details only may be wrong, the main stem is generally right. In this, local colouring is one of the chief things to guard against, and here the European ethnologist is generally at fault for want of local knowledge—at any rate when he deals with Polynesian traditions. No one who has for many years been in the habit of collecting traditions from the natives themselves, in their own language, and as given by word of mouth, or written by themselves, can doubt the general authenticity of the matters communicated. But it is necessary to go to the right source to obtain reliable information, and even then the collector must understand what he is about or he will fail.

' The men who really know the traditions of their race look upon them as treasures which are not to be communicated to everybody. They will not impart their knowledge except to those whom they know and respect, and then very frequently only under the condition that no use is to be made of them until the reciter has passed away.' These traditions were holy things and any deviation from the truth brought down the wrath of the gods. ' It is obvious from this, that traditions acquire a value they would

otherwise not possess. The fear of the consequences arising out of false teaching acted as an ever present check upon the imagination.'

" Anyone who has seriously studied traditions in conjunction with other social facts will bear out these remarks. Frequently they serve to throw a flood of light on dark places, and, if not forced to support any apriori view, but allowed to tell their own tale in their own time, they reveal the most unexpected results."*

When one sees how the natives of this portion of Africa are surrounded and restricted at every turn by what is generally known as Tabu, one is not surprised to find that behind the veil of this practice is to be found some of the most remarkable evidence of their origin. Tabu is by some authorities described as synonymous with " ceremonial uncleanness " and within certain limits this is no doubt correct; but when one considers the actions of Tabu in a wider sense and in more abstract forms, the definition, " curse," adopted by C. W. Hobley in his " Bantu Beliefs and Magic," becomes more applicable. In the sense where Tabu is used in connection with acts of physical contamination, the terms " ceremonial uncleanness " is certainly more correct, but it seems to the writer that even here the meaning expressed in the terms " curse " and " ceremonial uncleanness," stand rather in relation to one another of cause and effect. Now in the abstract sense we find that Tabu in one of its commonest forms applies to names that may not be mentioned except by means of paraphrases. In the case of the Maasai their dead are never to be referred to by their original names, in the same way that their warriors, when out on raids, may neither individually nor collectively be mentioned by name. In the latter case they are spoken of as " cattle." It would seem that in either of these cases Tabu rests on them as the result of the curse of death, and therefore of separation from the tribe. In the case of the warriors they may either have killed or been killed, in either case they have been contaminated by death, and death and separation from the tribe is for the time-being overshadowing them—they are under a form of curse and therefore all direct mention of them is Tabu, *i.e.*, forbidden.

Now we believe that the Maasai, and also other tribes consider that they are living under a curse. A direct expression of the knowledge of such a curse was related to the writer by Mr. A. M. Andersen with regard to the Kamasia people, a tribe closely allied to the Maasai, who say that they were once white but became black because they were cursed by a man long ago. That the Maasai,

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* W.J.P., 103.

too, in all probability, believe the same thing may be inferred from the question that they put to Merker, as to whether he belonged to the same original race as themselves, which would also imply that they believe that they were once light-coloured like himself. So proud a people, however, would certainly never admit that they were now living under a curse. If, as seems probable, the Maasai are ancient Israelites who came into Africa about 2,600 years ago, one has not far to seek for the origin of the curse, for the sacred writing of the Hebrews, especially those of their prophets, tell us of it, and that they were to go into exile as the result of their sins and wholesale neglect of their God Jehovah. That the knowledge of this curse should remain amongst them would be even less remarkable than their retention of traditions pertaining to their race which go back, as will be seen, to about 4,000 years. As the result of this curse they became separated from that earlier life and the land of their origin, which, as in the case of their dead and of their warriors, became under Tabu and could not be referred to except in a roundabout fashion by paraphrase. As will presently be seen, names and words that have any bearing on that former existence have, to a remarkable degree, been retained in the language of their origin, and, in a number of cases, in a paraphrastic form, which, however, when interpreted and taken in conjunction with all the other evidence, historical, ethnological, and not least, that of their ancient traditions, would seem to divulge unmistakably the true origin of these people.

It would seem that it is in their tribal names and such nomenclature as has some special bearing on their ancient traditions even when the original meanings have been forgotten, that one has, in the first place, to seek for linguistic evidence of the origin of native tribes; it would appear that their everyday speech has, as the result of intermingling with other races, and as the results of tabus, become so altered and changed that but a very small proportion of the original remains. Added to the reasons just given we also have the peculiar faculty of the Oriental, to which even the present-day Jew is so addicted—that of playing on words. One sees this in their instinctive fondness for parables and riddles, and their taste for expressing themselves in figurative speech, all of which is also apparent in the sacred writing of the Jews. This same instinct is also to be found amongst the " Semitic " natives in Africa, who delight in riddles of which they possess a great number. When the prophet Zephaniah, speaking of the eventual restoration of Israel, says " for then will I turn to the people a pure language." (Zeph. III. 9.) this statement, in all probability, referred to the knowledge that, as the result of their exile and their peculiar fondness for playing on words, and also as the result of the workings

of tabu under the system of the heathen religions which they had adopted, their language was bound to change and become corrupted from its original state; indeed it is likely that that process of corruption was already considerably advanced when the prophet uttered those words, for the dispersal of the kingdom of Israel had already taken place many years before.

To place the evidence brought forward in this review in satisfactory sequence, so as to present a clear, concise, and easily grasped summary, is no easy matter. It must be remembered that this is not intended as a record of ethnological data nor to describe native life and customs, but is an endeavour to prove from ethnograpical and historical facts, from native customs, traditions, and beliefs, the origin of the peoples in question. To do this it is necessary constantly to compare one subject with another; the writer has only used such matter as seems to bear directly on the problems in question.

Chapter II.

HISTORICAL REVIEW.

Merker arrived at the very definite conclusion that the Maasai are a Semitic race—of the same origin as the ancient Hebrews. He bases this conclusion to a great extent on the close resemblances that exist between ancient Maasai traditions and the Hebrew records of the Pentateuch. These resemblances are indeed so remarkable that one only wonders that he did not identify the Maasai with the Ancient Israelites. How he has just managed to miss the mark here, it is easy to see; it is because he has neglected historical research, and has instead brought forward such conjectures as the following; either the Maasai have arrived in their present locality by way of Arabia, which he considers the more unlikely alternative, or that they have come down via Egypt and the Nile valley in early pre-historic days before the Egyptians themselves came into Egypt, because, once the Egyptians were established in Egypt, any migrations of other races through their country would have been impossible. The object of this chapter is to give a short historical review showing not only the possibilitiy of Canaanitish migrations through Egypt, but that it appears that they are actually recorded as having taken place, and also to suggest the possibility of mass emigrations of Egyptians themselves into Central Africa.


SEKHMET. EGYPIAN GODDESS OF WAR
EGYPTIAN WARRIOR KING.
MAASAI WARRIOR

PLATE B.

For present purposes the history of Egypt can be divided roughly into four great periods. (1) The Pre-Historic. (2) The Ancient Kingdom, from the first Dynasty to the Hyksos. (3) The Hyksos. (4) The later Kingdom, from XVIIth Dynasty to the Roman occupation.

The people of the pre-Hyksos period were of a different type and character to those of later times, when they became strongly Semiticised in language as well as in type. Writing of the period from about 1,500 B.C., Sir Flinders Petrie, in his recently revised history of Egypt, points out how important was the change that occurred, due to the close contact established between the Syrian and the Egyptian.

" The striking change in the physiognomy and ideal type of the upper classes in the latter part of the XVIIIth dynasty points to a strong foreign infusion. . . .

"This intimate connection with Syrian craftsmen and Syrian women altered the nature of the Egyptian taste and feeling more profoundly than any influence since the foundation of the monarchy."* This foreign infusion having thus begun continued for centuries with the invasions of Assyria, and, above all, with the Persian conquest of Egypt by Cambyses, and the consequent Persian occupation which lasted over two hundred years. This again was followed by the Greek period, which eventually gave place to Roman rule, by which time the original Egyptian must have, to all intents and purposes, ceased to exist.

With regard to the Semitic races, the immediate neighbours of the Egyptians to the north-east, the Israelites and other Canaanitish races, we know that the former resided four hundred years and more, in the earliest days of their history, when they were but a small group, in Egypt. That they in their turn intermarried with the Egyptians we know, for Joseph married a daughter of the Priest of On, and having secured the entry into the families of the aristocracy, it is reasonable to suppose that further infusion of Egyptian blood took place, particularly amongst his descendants the tribes of Ephraim and Manasseh, and this no doubt continued until the Exodus from Egypt. That intermarriage occurred at later dates we also know, and an intimate relationship with Egypt existed all through the history of the Israelites, who were never averse from marrying Egyptians. Neither must it be forgotten that the great caravan route between Egypt and Syria led through their land, and that they were for the greater part of their history dependent on the

* F.P., I., 148.

goodwill of Egypt to whom they also paid tribute at times, in spite of which, however, they always seem to have been on a friendly footing with these their mighty neighbours.

The purpose of dwelling on these facts is to show that in type, customs, etc., a close affinity must have existed between the people of Canaan and the Egyptians at the time that the Canaanites were driven out of their country, and, assuming that we have in Central Africa to-day ancient Egyptians of the later dynasties and Canaanitish people living side by side with each other, we can understand that it cannot be too easy to distinguish between them.

How did these Canaanitish people come to migrate into Egypt, and from thence into Central Africa? Knowing that the system of carrying whole bodies of people into captivity, using both men and women as slaves besides taking numbers of women as concubines, was an universal practice in ancient warfare, one cannot wonder if nations and tribes, or the remnants of them, fled from the invaders or conquerors to escape this state and to take refuge with friendly neighbours. The fate that awaited captives is well expressed in the words of Sennacherib:—"The people of Chaldea, the Arameans, the Mannai, the men of Kae, the Phœnicians who have not submitted to my yoke, I carried away, and set them to forced labour, and they made bricks." In this way Egypt became a constant recipient of refugees from Canaan, and how customary this was will be seen by quoting from Petrie's writing on the reign of Psamtek I. where he refers to the camp at Defneh, the fortress on the Eastern frontier of Egypt:—"This Greek camp formed a place of refuge for the Jews during the frequent waves of Assyrian conquest, and last appears in the account of Jeremiah as Tahpanhes."* Amongst these waves of conquest was that caused by the refusal of Hoshea, king of Israel, to pay tribute to the king of Assyria, who instead appealed for help to So, King of Mizraim (2 King XVII. 4.) which resulted in the siege of Samaria which lasted three years. In 722 B.C. Samaria fell to Sargon, and the tribes to the East of Samaria were carried away into Assyria. Those to the North had already been taken into captivity as the result of a previous Assyrian invasion. Sargon now turned his attention to subduing his tributary dominions in Syria, which he easily effected, and in the process of which it is recorded that he had the king of Hamath flayed alive. He then returned to Palestine to finish what he had left unaccomplished. He marched right down through Palestine to the borders of Egypt, inflicting a total defeat on the combined armies of So, or

* F.P., II., 330.

Shabaka, and the kings of Raphia and Gaza, completely routing them before Raphia, a city to the South of Gaza in 720 B.C.

With the fall of Samaria the Israelitish tribes to the east were, as was seen, carried away captive into Assyria, and, with this example before them as well as that of Sargon's rigorous treatment of the Syrians, it would have been surprising if the tribes left to the west and south-west of Samaria had not fled before the renewed advance of the Assyrian forces, not stopping until they were safe within the borders of friendly Egypt. These tribes would have been those of Ephraim and the half tribe of Manasseh whose country lay along the coast of the Mediterranean. As the result of this fighting Egypt lost its hold over Palestine, and the Kingdom of Israel also thenceforth ceased to exist.

Another occasion for such a flight into Egypt would have been after the defeat of Pharaoh Nekau at Charchemish 605 B.C. by Nebuchadnessar, whose armies followed the retreating Egyptians into Palestine, when remnants of the people of the Kingdom of Israel, and more particularly the tribes of Manasseh and Ephraim, would have followed the flying army of the Pharaoh into Egypt. This is the more likely as Nekau's forces at the time were chiefly composed of mercenaries, and it is most probable that he had Israelitish troops drafted from the remnants that had remained in their country at the time of the Sargon invasion. These troops fearing the retribution that they had to expect at the hand of Nebuchadnessar would in their flight have collected with them the other remnants of their people and taken refuge in Egypt.

The historical evidence of the flight of Israelitish refugees into Egypt has already been recorded; it now remains to be seen what happened to them there. Petrie speaking of a later period says:— " The next year Jerusalem fell, the Babylonian set up his own governor, who was overthrown; and, after this ' Johanan the son of Kareah and all the captains of the forces took all the remnant of Judah, ... men, women and children, and the king's daughters, ... and Jeremiah the prophet . . . . , so they came into the land of Egypt, ... thus came they to Tahpanhes' as Jeremiah relates (XLII. 5.); and so to this day Taphanhes, or Defneh, is called the fort of the Jew's daughter. And Jeremiah took great stones, and ' hid them in the clay of the paved area (A.V. brick kiln) which is at the entry of Pharaoh's house in Taphanhes ' and prophesied that Nebuchadrezzar would ' spread his royal pavilion over them.' In the clearing of the fortress of Taphanhes the paved area before the entrance was actually found, and was a place quite suitable for setting up a royal tent. The absence of any royal wine jars of this reign agrees

with the place having been given up to the Jewish fugitives; and such exiles would have been a useful frontier guard, certain not to league with the Babylonian.* . . . . In 568 B.C. Nebuchadrezzar marched into the Delta. . . . . so the cylinder inscriptions of Nebuchadrezzar found in the Isthmus of Suez may be accepted as showing that he did at least enter the Delta, and pitch his royal pavilion before the entry of Pharaoh's house in Taphanhes."†

From Petrie we learn further that from the VIIth century B.C. and onwards a colony of Jews settled at Elephantine and doubtless elsewhere in Egypt.§ These Jews at this early time could have been no other than the refugees out of the Kingdom of Israel that we have now discussed, for the troubles of kingdom of Judah and the necessity of going into exile, did not begin until half way through the VIth century B.C.

The reference just made to the colony of Jews settled at Elephantine is of peculiar interest in connection with the following. We learn from Herodotus that in the reign of Psamtek (664-610 B.C.) the garrison stationed at Elephantine on the Ethiopian border mutinied and deserted into Ethiopia. Having seen that prior to this the Israelitish tribes would have taken refuge in Egypt as the result of the dispersal of the kingdom of Israel 722 B.C. and also the use to which such exiles would have been put, and the existence at this time of the Jewish colony at Elephantine, it may be supposed that the greater portion of the troops stationed at Elephantine were composed of Canaanitish exiles. Herodotus' account of this desertion into Ethiopia is as follows:—" . . . . the Automoli, who are also known by the name of Asmach. This word translated into our language, signifies those who stand on the left hand of the sovereign. This people, to the amount of two hundred and forty thousand individuals, were formerly Egyptian warriors, and migrated to these parts of Ethiopia on the following occasion: in the reign of Psammitichus they were by his command stationed in different places; some were appointed for the defence of Elephantine against the Ethiopians . . . . When these Egyptians had remained for the space of three years in the above situation, without being relieved, they determined by general consent to revolt from Psammitichus to the Ethiopians; on intelligence of which event they were immediately followed by Psammetichus, who, on his coming with them, solemnly adjured them not to desert the gods of their country, their wives and

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F.P., II., 344. † ID., 353. § F.P., III., 59.

their children. One of them is said to have replied, that wherever they went they would doubtless obtain both wives and children. On their arrival in Ethiopia, the Automoli devote themselves to the service of the monarch, who in recompense for their conduct assigned to them a certain district in Ethiopia possessed by a people in rebellion against him, whom he ordered them to expel for that purpose."* Now Herodotus informs us further that it took four months by way of the Nile and partly by land to get to the country of the Automoli from Egypt, and that it took fifty-two days from the borders of Egypt to the city of Meroe on the Nile in Ethiopia. Measuring out on the map the distance as represented by the extra sixty-five days' journey from Meroe to the country of the Automoli we find that this country is just south of present day Abyssinia. Herodotus has given us two names for these people; Asmach and Automoli—Asmach is in all probability the Egyptian name, for Automoli is the Hebrew word Semoli, to which Herodotus has applied the Greek prefix Aut in place of the S of the Hebrew word, and the Hebrew Semoli has the same meaning as that given by Herodotus, *i.e.*, " on the left hand side " meaning the left hand army of the king or those who fought on his left hand wing. In that portion of Africa where Herodotus has placed the land of the Automoli, or more correctly Semoli, we find to-day widely distributed a people called the Somali. This certainly is strong evidence that the troops who deserted at Elephantine were not Egyptians but Semites, a portion of whom have retained the same ancient name by which they were known in the days of Herodotus. In passing we may mention that the Automoli are not generally accepted as of Egyptian stock; Petrie quotes Maspero in " The Passing of the Empires," p. 499, who suggests that they were the Mashawasha who had figured for some considerable time in Egyptian history. It has not been established who these Mashawasha really were, but they are supposed to have been made up of a group of tribes who were neighbours to the Egyptians who have not been definitely identified or located. On considering the story as told by Herodotus, it does not seem likely that Egyptian-born trops would have deserted in this fashion, but if we suppose the garrison at Elephantine to have consisted of Canaanitish auxiliaries, the picture presented at once becomes comprehensible. We see in these mercenaries dissatisfied Semitic troops who had been posted for three years on the southern frontier, instead of at Daphne, where they would have been at hand when a suitable moment arrived to strike a blow against Assyrian rule in Palestine, and by that means possibly regaining their own country.

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* Her., II., xxx.

Probably they were also dissatisfied because the Greek troops, who had helped Psamtek to gain his throne, had been given the place of honour as " those on the right hand side of the king." If the temper of the Automoli was at all the same as that of the Somali and Maasai to-day, one can quite understand their indignation at their secondary position which they would have considered an insult. When, in reply to Psamtek's appeal to them not to desert their wives and children, the Automoli soldier retorted that they would doubtless find wives and children wherever they went, the reply was perhaps not purely ironical, as most likely arrangements had already been made by which the families of the mutineers had been sent on ahead into Ethiopia to await them.

Herodotus states the number of these Automoli to have been 240,000. One can be sure that this number was not made up of only one tribe, but of several tribes, though no doubt they were closely allied to one another, who for the time being were all included under the one name Automoli or Semoli, *i.e.*, " those on the left hand side," which name was eventually only retained by one portion which we recognise as the Somali of to-day. We shall give more evidence later in support of the supposition that the Automoli were the ancient Israelites.

It is not to be supposed that this was the only flight from Egypt into Ethiopia. Another on a considerable scale immediately prior to the one just referred to, is suggested in the reign of Tanutamen of the Nubian dynasty (667-664 B.C.), who was obliged to retire from Egypt to Ethiopia before the conquering army of Ashurbanipal of Assyria. That numbers of Canaanitish auxiliaries, who would have feared the Assyrian invasion more than others, would have followed him into Ethiopia, is extremely probable, more especially too, as these Canaanites would have come into Egypt as refugees under the reigns of preceeding Ethiopian rulers. The devastation that Ashurbanipal caused as the result of this invasion is best expressed in his own words:—" My bands took the whole of Thebes, in the service of Asshur and Ishtar; silver, gold, precious stones, the furniture of his palace, all that was; costly and beautiful garments, great horses, men and women, ... I removed and brought to Assyria. I carried off spoil unnumbered."* A little more than a century after this came the Persian conquest of Egypt by Cambyses. The Persians held Egypt upwards of two centuries; some periods of this occupation were a reign of terror for the

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* F.P., II., 307.

Egyptians. From the accounts of this Persian occupation we gather such notes as the following:—" He reduced Egypt to a worse state of servitude than it was under Darius."† " A third brother Ochus took the name of Darius. More casulties produced more revolts; but in spite of a revolt in his second year, Darius kept his hold until 405 B.C."§ What results Cambyses' invasion and his march through Egypt on his way to conquer Ethiopia may have had in causing Egyptians to flee before his advance to take refuge in Ethiopia or beyond can only be surmised, as no records exist concerning the matter. About 350 B.C., however, we have a record of a flight into Ethiopia as the result of another Persian invasion. " Pelusium was outflanked, and fell by surprise. Nehktnebf retreated, and the Greeks carried all before them. Memphis was abandoned, and the king fled to Ethiopia with his treasures."

It is reasonable to suppose that not only large numbers of troops followed him but that many of the common people also followed in what was evidently a panic. " Of the three Persian kings who filled this time (342-332 B.C.) . . . . nothing whatever is known in Egypt. The miserable land was a prey to their rapacity. Ochus placed an ass in the temple of Ptah, and slaughtered the Apis for a banquet, as well as other sacred animals. The temples were utterly looted, the city walls destroyed. Egypt lay wasted and wrecked . . . . " * It is only natural to suppose that this sort of thing with all the abuse and oppression to which the people would have been subjected, and the constant dread of being carried away into captivity would have caused mass emigrations from the country. All such emigration must necessarily have taken place for the most part towards the south, and so large numbers of these emigrants would have found their way into the lands south of Ethiopia. The historical records of the Jews state quite definitely which portions of the kingdom of Israel were taken into captivity to the east, into Assyria (II. Ki. XV. 29; II. Ki. XVII. 6. I. Chr. V. 26) and it is to be noted that nothing is said of the south-western portion of the kingdom which included the tribes of Ephraim and Manasseh. The prophet Hosea (Chap. IX. 3, 6.) foretold that Ephraim should go into captivity in Egypt, Ephraim, meaning here the " house of Joseph," standing for his own tribe as well as for that of his brother Manaseh. This prophecy, Hosea very probably lived to see fulfilled, and when Zephaniah, writing about a hundred years later, prophecies of the eventual return at some future date of Israelites " from beyond the rivers of Ethiopia," he is no doubt referring to what was a known, accomplished, historical fact, *i.e.*, that these Israelites

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† F.P., II., 369. § ID., 371. * ID., 389.

were, at that very time, in the regions of Africa to the south of Ethiopia.

The migrations of Egyptians and Canaanites through the country of Ethiopia would seldom have met with any resistance, more especially as the throne of Egypt was occupied for considerable periods by Ethiopian rulers. The Ethiopians on the contrary would have welcomed such migrations as augmenting their strength in anticipation of some day with the assistance of such willing helpers, evicting in their own favour the foreign invaders of Egypt from the north east.

We have not touched upon what may have been the result of forcing the ancient Egyptians of the XIIth to the XVIth dynasties to evacuate their country as the result of the Hyksos invasion. A short glance at what they were then subjected to is however of interest. From the records of Manetho we quote the following:— "... and there came up from the east in a strange manner men of an ignoble race, who had the confidence to invade, and easily subdued it by their power without a battle. And, when they had our rulers in their hands, they burnt our cities, and demolished the temples of the gods, and inflicted every kind of barbarity upon the inhabitants, slaying some, and reducing the wives and children of others to a state of slavery. . . . . These six were the first rulers among them and during the whole period of their dynasty they made war upon the Egyptians with the hope of exterminating the whole race." How this may have affected these ancient Egyptians, and induced emigration even at this early date no records are left to relate, but such emigrations into the countries of the south may have been possible even then.

Until how late in history the migration of peoples from the north-east into Egypt, and of the Egyptians out of Egypt, continued to take place the extracts from J. G. Milne given below will show. That those foreign races which migrated into Egypt would have remained in that country under conditions that even the Egyptians themselves found hard to endure is not likely, and it is reasonable to suppose that they were but birds of passage through that country, and when opportunity offered would have gone further afield southward into Africa where they would not only obtain their cherished tribal freedom, but where the natural conditions were probably better than they are now, for science tells us that Africa is and has been getting gradually drier and in parts less habitable.

With regard to the migrations of peoples from the north-east into Egypt at later periods Milne tells us, speaking of the year 616 A.D.:—" But if Niketas had any such scheme in view, he had

not time to carry it into effect before he was dispossessed of his control of Egypt by the invasion of the Persians. When Heraclius was recognised as Emperor, they had captured Antioch, and they gradually worked southwards through Syria and Palestine, whence great crowds of refugees fled into Egypt."* Speaking of the reign of Constantine he describes the conditions of Egypt as being such that the Egyptians themselves had been obliged to leave the land:— " But the state of the cultivators of the land was in many districts desperate, owing to the burden of taxation and the neglect of irrigation: a group of documents from the village of Theadelphia in the Fayûm shows that in the reign of Constantine nearly all the inhabitants had fled and only three out of twenty-five of those on the assessment-list were left to pay taxes on land of which the greater part was unwatered."†

Though little actual evidence exists as to the details of the various mass emigrations of ancient Egyptians that may have taken place as suggested above,, it would have been extremely unnatural in the face of centuries of invasion by foreign races, and the consequent persecutions that the people would have had to endure, if such emigrations had not taken place; there was practically only one direction in which they could have fled—south, into the heart of Africa. That these emigrations were not hampered by lack of means of communication from Egypt to the south, is suggested both by the fact that Egypt itself was in communication with Central Africa via the Nile Valley, and also because we know that in the days of the Ethiopian dynasties large bodies of troops were being moved to and fro between Egypt and Ethiopia.

Having completed this historical review of the migrations out of Egypt southwards, it is well to take a short glance back along the route that the Maasai are supposed to have come in their wanderings down into Central Africa. One thus finds a broad belt of tribes closely allied to the Maasai, both in type, language and customs, stretching in a north-westerly direction up the Valley of the Nile to about 12° N.L. North of the Maasai, whose southernmost territories begin at about 5° S.L., are the Lumbwa Nandi with numerous smaller allied tribes at each side of them from the Uganda border to the escarpments of the Rift Valley. North of these, again, come the Suk and Turkana beyond which in the countries round the upper Nile are the Acholi, Bari, Latuka, Dinka and Shilluk. Speaking of this large group Sir Charles Eliot in his foreword to Hollis' " The Masai " says:—" The whole group are sometimes classed together

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* J.G.M., 114. † ID., 93.

as Nilotic, and have many peculiarities in common. Their languages show a considerable, though varying, degree of affinity; physically they are tall, thin men, with features that are not markedly negroid, and are sometimes almost Caucasian; several remarkable customs, such as the nudity of the male sex and the habit of resting standing on one leg, are found among them all. . . . A glance at the map will show that from the Rift Valley to the Nile there runs in a north-westerly direction a broad belt of non-Bantu languages, more or less allied to one another, Masai, Nandi, Suk, Turkana, Karamoja, Latuka, Bari and Dinka. The Karamoja appear to be Bantus who have been forced to accept an alien form of speech. This distribution of languages seems clearly to suggest a south-eastward movement from the country between the North of Lake Rudolph and the Nile. The hypothesis is rendered more probable by the fact that in East Africa as elsewhere the course of invasions has been mainly from the north to the south. This is certainly the case with the Gallas, Somalis, and Abyssinians (who are rapidly encroaching on the Protectorate), and probably with the Bahima. It also seems probable that the physical type of these races (Masai, Nandi, Turkana, Dinka, etc.) represent a mixture between negro and some other factor."*

Speaking of influences that may have come down into Africa from the north Hobley in his " Bantu Beliefs and Magics " says:— " For ancient religious influences on Central Africa, we must look more to the channel afforded by the Nile Valley which had become a route of exploration as far back as the time of the Pharaohs. Although, however, we know that Egyptian influence was spasmodically exercised for a long distance up the Nile Valley, ... The only case of permanent settlement which appears to be beyond doubt is the invasion into Uganda, Unyoro, and Ankole, of a light coloured race, now know as the Ba-Hima or Ba-Huma. Some consider that these people came from the Abyssinian highlands; Sir Harry Johnstone, on the other hand, believes them to be descendants of ancient Egyptian settlers; according to Dr. Seligman they are probably descendants of what he terms Proto-Egyptians—the latter description being a more concrete definition based upon careful researches in the Nile valley, the result of which was not available when Sir H. H. Johnstone made his suggestion. . . . . It is, moreover, highly improbable that the ancient Semitic beliefs should have originated in East Africa. We must, therefore, decide whether such similarity as we find to-day is merely a case of parallel and unconnected development, or the result of an ancient invasion of a

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* A.C.H., I., xii.

Semitic race or possibly of a race which had adopted Semitic beliefs. In the present state of knowledge it will be safer to assume that this similarity is due to parallel development. . . .

" It is, however, necessary to make it clear that if there should have been any Semitic influence it cannot have been derived from the Arab settlements on the East Coast of Africa, founded during the last few hundred years. Their political hold of the country never extended much beyond the tidal waters, and their only social influence was the slight one exercised at intermittent intervals by a slave raiding or ivory trading expedition. No ancient trace of Mohammedanism can be found among the people under consideration, and their present state of culture is pre-Islamic in point of time."†

The references that we have here quoted from two well-known authorities have been given to show that the general impression favours the immigration into Central Africa of the Maasai at one point and the Bahima of the south-west of the Uganda Protectorate on the other from somewhere down the Nile, and we will close this chapter with the following remark by Sir Charles Eliot:—" A tribe coming from the north like the Masai, and possibly at one time in touch with races influenced by ancient Egypt, may conceivably represent not an improvement of the primæval African stock but a degeneration of some other race. . . . . "* And how intimate this suggested contact with ancient Egypt must have been will be shown also by ethnographical evidence of traditional customs so unmistakeably ancient Egyptian that they can hardly have been acquired except by actual direct intercourse with Egypt itself.

Chapter III.

ORIGIN OF MAASAI AND BORNEAN TRIBES.

As suggested by their deities and tribal names.

Though the historic data at present available does not allow us to follow in any detail the wanderings through which the tribes of Borneo reached their present abode, there is, as we shall see in a later chapter, enough to enable us to realize the principle causes

† C..W.H., 20. * A.C.H., I., xiv.

which may have brought them into the Malay archipelago from what may have been the land of their origin in Western Asia.

We will now deal with some of the tribal names and religious traditions, first of the Maasai, and then of the Borneans, in order to show that both in themselves, and by means of the evidence produced through comparing them together, they point in either case to the same Canaanitish origin.

Dealing with the Maasai we hope first to show the origin of their present-day religious traditions. The Maasai have a supreme deity whom they call *Engai* (*eng* being the article and *Ai* the name of the deity). This Engai is, remarkably enough, *feminine*. They have besides two inferior deities, their " black god " or good god and their " red god " or malevolent god. What this little pantheon represents we will now see. We find their equivalent in ancient Egypt. Here is the picture: Hathor, the great and popular goddess of ancient Egypt, was in one aspect worshipped in the form of a cow. She was pre-eminently a sky-goddess, and was the personification of the great power of nature, which was perpetually conceiving, bringing forth, rearing and maintaining all things. Hathor was represented as a cow giving milk to the sun-god; hence also the Egyptian kings, as identified with Horus, are sometimes figured at the breast of the Hathor cow.* This account of the goddess Hathor is of importance, for as will be shown later, when we shall speak of her in her other aspect as " The Lady of the Fig-tree " she would seem to be connected with other native religious traditions of Africa to-day.

The famous statue of the divine cow Hathor, found in 1906 by Ed. Naville at Deir-el-Bahari, and now in the Cairo museum, enables us to identify both the Maasai Engai and their black and red gods. The following is quoted from Sir Gaston Maspero in his " Egyptian Art," where he describes this statue:—" The front view shows only the head surrounded by accessories, ... At the top of the composition, between the tall horns in the form of a lyre, the usual head-dress of goddess-mothers, is the solar disc flanked by upstanding feathers with an inflated ureus . . . . Under the snout (of the cow), ... is the statuette of a man standing, his back to the cow's chest. . . . . the face is mutilated, the flesh black; he stretches out his hands, palms downwards, in front of him with a gesture of submission, as if avowing himself the humble servant of Hathor: . . . . we guess him to be a Pharaoh. He is found again in a less punctilious attitude under the right flank of the statue. He is kneeling, naked, and his flesh is red; he presses the teat between his

* AE.K., 39.

hands, and drinks greedily of the sacred milk. If we may believe the cartouche engraved between the lotuses, the two figures, the black and the red, are one and the same soverign, Amenothes II. of the XVIIIth dynasty."* And here we have first of all the supreme deity—female as we noted—of the Maasai, the great goddess Hathor of ancient Egypt. The black figure, standing under the head of the cow, represents the Pharaoh belonging to this world who was divine in ancient Egypt in his lifetime, and was worshipped by his people as " the good god "; the " black god " of the Maasai is their " good god." The red figure, the Pharaoh who has passed into the other world, who no longer takes a kindly interest in men may have become the " red god " of the Maasai and in course of time their malevolent deity. As an alternative it may be suggested that " the black god " may have been Osiris who was sometimes depicted as black, and the " red god " may have been Typhon or Set—the evil deity of the Egyptians who was depicted as red. It is also possible that a confusion existed between these alternatives, for the ideas of the ancient Egyptians themselves concerning their deities seem to have been rather indefinite. The object here is in the first place to show the probable *Egyptian* origin that we claim for the Maasai deities.

Hathor was also regarded as a goddess of love and from the earliest times she was the great mother-goddess of the masses in Egypt, while the cultured classes worshipped Isis, the mother of Horus. *Ai* was the great mother-goddess of Babylonia and the wife of the sun-god Shamash, and we seem to recognise her again in Canaan, where she was evidently worshipped by the Ammonites in the city of Heshbon, probably as their great mother-goddess by the side of Melcom (Jer. XLIX. 3.). " *Ai* " probably meant then, as *Engai* amongst the Maasai to-day, merely " the goddess," and, as " The Goddess," *Ai* was probably known to some of the Canaanitish peoples. (By what article her name was prefixed amongst the Semites of Canaan is not known, for in Jeremiah the name stands alone, without an article). That *Ai*—" the goddess "—should in its turn have been applied by Canaanitish peoples to the popular mother goddess of Egypt, whom they would have identified with their own deity, is perfectly natural, and thus we see how *Ai* in its last stage would have become the Masaai *Engai* as identical with the Egyptian Hathor. This worship of Hathor, the great cow deity would naturally have appealed to a pastoral people, and we seem to see again the influence of this worship in the custom prevalent amongst the Maasai of on occasion milking their cows into their mouth direct; this was originally to them no doubt the same rite or sacramental

* G.M., 108.

ceremonial of partaking of the milk of life from the deity that we have seen in the case of the Pharaoh of the Deir-elBahari cow: another example of the sacramental drinking of the milk of life from the deity is found in another Kenya tribe and we shall refer to this later on. One sees perhaps the same origin in the Maasai custom of bleeding bullocks and drinking the blood, sometimes even sucking is straight from the wound, and one wonders if this may not also have been an ancient Egyptian rite of partaking of the blood of life straight from the sacred cow, as a personification of Hathor. It is no exaggeration to say that cattle are sacred to several of the tribes of Africa, and the Maasai and allied tribes certainly venerate their cattle in a manner that gives one just reason to suspect that they are, to all intents and purposes, sacred to them.

It must not be forgotten that the Israelites had for a considerable time before their exile accepted the heathen religions of their Canaanitish neighbours, in which the worship of the mother goddess was predominant, and their prophets declare this to have been the reason why they were dispersed and driven from their country. When one knows that these religions were very similar in their main conceptions to those of Egypt, it is easy to understand that the Hebrews would readily have accepted the deities of Egypt and identified them with those of their previous worship.

Having thus reviewed what we believe to be the origin of the divinities of the Maasai, and before passing on to the Bornean peoples, we wish to give some evidence of the racial origin of the Maasai as we see it in their tribal names.

The very important part that tabu plays in the lives of these natives, has already been referred to in the introductory chapter. We now come to see how its influence has affected tribal names. With regard to the name *Maasai* itself, this seems to have come into use fairly recently for not so long ago they called themselves *Maa.** This change was probably deliberate as the fact is still remembered, and it is possible that the name Maasai, as an earlier variation was retaken into use, after having for some time and for some reason or other been under tabu. The writer cannot believe that a people who are not only so conscious of their own superiority, but so extremely loyal to ancient traditions and customs, could allow their tribal name to fluctuate unsystematically. We believe the Maasai to be no other than the Israelitish tribe *Manasseh* or *Manasay* as is a more correct rendering of the Hebrew. Hollis, spelling phonetically writes " Masai " *Maasae*, on the strength of which we

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* A.C.H., I., 267.

have adopted the spelling *Maasai*, as we consider this is still nearer the original than " Masai."

So many of the names figuring in Maasai traditions appeared to be of a composite character, just as in Hebrew, and as the Maasai language itself is to such a considerable extent built up of composite words, we believed ourselves justified in adopting the following method of dissecting names. These examples will show how Maasai composite words sub-divide. Thus the Maasai for the elephant is *Ol le-'ng-aina* = the of the arm; the father is *Ol o-i-u* = the who begets; in neither case is it specified who or what has " the arm " or " begets," as the context would make this clear. For the sake of comparison we now give a few Hebrew words, similarly sub-divided. *Abiezer—abi-e-zer* = father of help; *Benjamin—ben'-ja-min* = son of the right hand; *Zechariah—zek-ar-i-ah* = whom Jehovah remembers. It is well to mention here that in the case of Bornean names we have found the same principle of sub-division applicable.

Maasai—this name written more phonetically according to Hollis is *Maasae* and comes very near to the Hebrew *Manasay*, meaning " one who causes to forget."

We have thus the *Ma-a-sae* the first clan of which
tribe is that of *L'Aiser* the first family of which
clan is called *Gidon*.

The exact equivalent and sequence is found in the Biblical records of the half tribe of Manasseh that would have gone into exile into Egypt. The name of this tribe

is as seen *Ma-na-say* the first clan of which was
Abi-ezer or *Je-ezer* the great hero of which clan
was the judge, *Gideon*, so famous in the history of the Israelites.

The Ol oibonok, *i.e.* the elders of the Maasai all claim that they come of the family of *Gidon*, and according to their ancient traditions the founder of this family, to whom they trace their pedigree, was one *Kidonoi*. (The rest of the evidence to be drawn from this very interesting tradition concerning their elders will be dealt with in another chapter). The other three clans of the Maasai are *Il-Mengana*, *Il-Mokesen*, and *Il-Molelyan*. They would appear to sub-divide and translate as follows:—

Il-Me-'ngana = The people of Canaan, *'ngana* probably an abbreviation for *Canaan*.

Il-Mo-kesen = The people appointed, from the Hebrew *kese* meaning " appointed." Notice the similarity to the well-known term " The chosen people."

Il-Mo-'l-elyan = The people of the Most High, from the Hebrew *elyon* = " Most High," and often used to express Jehovah.

These are probably all ancient paraphrases to hide their original clan-names from the time of their first coming down into Africa, and have been faithfully retained, though the meanings have probably long ago been forgotten, at least by the mass of the people, though possibly kept guarded as sacred tribal secrets by select elders. With regard to the Mokesen: the Maasai vocabulary includes the word *kesen*="the cloth in which a baby is carried," but it is difficult to believe that the name of a clan should have such a meaning, on the other hand, the word for this cloth is probably derived from the Hebrew *kese*, in the sense of this particular cloth being "appointed" or destined for this special purpose; this is suggested by the fact that a peculiar cloth is used for carrying infants, and, as we see, it has a special name. It is well to mention in this place that, as with the Maasai so with the Borneans, the original meanings of names and words have been lost, though, as suggested, certain ones with a bearing on specially prized traditions may yet be known by the elders of the tribes. As we shall now see it is possible to re-construct the lost meanings of certain Bornean names and words figuring in their traditions, by means of a knowledge of the Maasai language.

With regard then to the Borneans we find that their supreme deity is called *Laki Tenganan*,* the original meaning of which name they have lost, but with the help of the Maasai language we are able to interpret it. *L'akir* is the Maasai for stars, and here we have the meaning of the first part of this Bornean name—*the star*. The meaning of the second part would seem to be the same as that of name of the Maasai clan *Mengana* which we have just discussed, and *Te-'nganan* would mean "of Canaan" the whole being thus *L'aki Te-'nganan=The Star of Canaan*. (Canaan is a composite word as follows Ka-na-an=the low region). This word *Tenganan* we find too in the Maasai language in their word for man=*tungani*, which is even more clearly expressed in *tungunan* of the Turkana people, who are closely allied to the Maasai. *Tungani*, *tungunan* no doubt originally "of Canaan," *i.e.*, "a man of Canaan," the meaning of which having become forgotten it became applied to any man indiscriminately. Now the Maasai have also their equivalent of "The Star of Canaan," though they have also lost the original meaning. They call the star of dawn, *i.e.*, the morning star: *Ol akira le-'ng-akenya*. The Maasai word *rukenya* means mist and the country at the foot of Mt. Kenya is called by them *en gop e' rukenya*=the land of mist. This comes very close to the meaning of the name *Canaan*=the low regions, which suggests darkness and mist, and more especially so when it is realised that the Hebrew

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* W.J.P., 147.

word for cloud is *anan* and comes from the same root as Canaan. We see here how the Maasai word for " the low regions " at the foot of Mt. Kenya, has the same root as their name for the star of dawn, and the equivalent to this we find in the *Laki Tenganan* of the Borneans, where the name of the star includes the name of Canaan, " the low region," and we cannot help believing that originally *rukenya* of en gop e' rukenya and *akenya* of ol akira le-'ng-akenya stood for Canaan or was possibly a paraphrase of it. If this supposition is correct, the name of the colony, Kenya, would be equivalent to Canaan.

The morning star held a peculiarly significant meaning for the ancient Israelites. It stood to them for their promised Messiah, and is referred to in their sacred writing as " The Star out of Jacob " and as " the bright and morning Star." That this tradition still lives after a fashion amongst the Maasai, and that " the morning star " has a special significance for them, may be gathered from the tradition of paradise, given by Merker, and which we will give further on, in which the " morning star " is set to guard the entrance to paradise. The Laki Tenganan, " The Star of Canaan " 'of the Borneans represents another individual, as will presently be shown. The probable Hebrew origin of the Maasai L'akir and the Bornean Laki will be discussed later.

In the creation myths of the Kayans we find the following:— " In the beginning there was a barren rock. On this the rains fell and gave rise to moss, and the worms, aided by the dung-beetles, made soil by their castings. Then a sword-handle came down from the sun and became a large tree. From the moon came a creeper, which hanging from the tree became mated with it through the action of the wind. From this union were born Kaluban Gai and Kalubi Angai, the first human beings, male and female."* Slightly reconstructing the first name, we have *Kalub Angai* and *Kalubi Angai*. *Knowing* that the Maasai *Engai*, also called *Angai* means the God, and that Ai was known too in ancient Edom and is found in the name of the Edomite king, mentioned by Sennacherib, Ai (An-aa)-rammu=" Ai is high,"† we are able to interpret the meaning of these two words as " Kalub the god " and " Kalubi the god," these two first human beings having been raised to the rank of deities which, however, they no longer retain. This practice, as will be shown, of deifying their ancestry was customary amongst these people in very ancient days, and is one that they still follow.

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* H.mD., II., 137. † E.R.&E., " Edomites."

Having assumed that these Bornean people are of Canaanitish origin, one is struck with the strong resemblance of the Bornean name *Kalub* to that of the Biblical hero *Caleb*, one of the spies who led the Israelites into the Promised Land. On looking up the pedigree of Caleb we find that he was a *Kenezite*, in other words a descendant of *Esau*, who was also called Edom. Caleb, though an Edomite, had been adopted into the tribe of Judah. Now we learn from the Hebrew records that the Edomites had deified their ancestry:—"Thou exaltest thyself as the eagle, and though thou set thy nest among the stars." Ob. 4. ("The star of your god, which ye made to yourselves." Am. V. 26.). This statement was nothing else but the record of a well-known historic fact, for the records of ancient Egypt tells us that Esau or Edom was included in the Egyptian pantheon and worshipped under the name of *Usos*. Esau was also worshipped by the Phœnicians, according to Philo Byb. (Euseb. Praep. Evang. i. 35), who also calls him *Usoos*. E. of R. & E. "Canaanites." And the supreme deity of the Borneans, *Laki Tenganan*, can be no other than this same deified Esau, their great ancestor, whom they had honoured by making him their supreme deity and their "Star of Canaan." *Laki Tenganan* has a wife. *Doh Tenganan*, who is also worshipped by the Borneans, who is therefore no other than Esau's wife *Adah*, and we find too, that the Usoos worshipped in Egypt had a female counterpart:—"The war-goddess Aasith appears to have been of Semitic origin, and becomes interesting to us chiefly by reason of the link which Muller finds between this divinity and the hunter Esau, deified as Usoos, whose female counterpart he believed her to be."* The name *Doh* is obviously the same as that of *Odoh*, found amongst the Borneans, and is evidently a variation of the Hebrew Adah, the *a* having become interchangeable with *o* in course of time. As crowning evidence in support of the identification of *Laki Tenganan* and *Doh Tenganan* of Borneo, with *Esau* and *Adah* on the Biblical records, we find the following story current amongst the Borneans concerning Esau and Adah:—Usai was the guardian of the shades of men. His wife desired to have a large prawn that lived in the Baram river; so Usai built a dam across the river at Lubok Suan . . . . . and baled out the water below it, seizing the crocodiles with his fingers and whisking them out on to the bank. While this operation was in progress, the dam gave way; and Usai's wife was drowned in the sudden rush of water. In vain he sought for his wife, weeping bitterly. Disconsolately he waded down the river. At the mouth of the Pelutan he wept anew, throwing aside the crocodiles as he explored the bed of the river. At Long Salai he found his wife's

* A.E.K., 9.

coat and wept again. At Long Lama he found his wife's waist-cloth and gave up hope, and at Tamala he clucked like a hen, so great was his grief. Still he went on wading down the river. The water, which at Long Plusan was only just above his ankles, reached his middle at the mouth of the Tutau, and covered all his body at the place where the Tinjar . . . . flows into the Baram. At the mouth of the Adoi he wailed aloud, " Adoi, Adoi! " (a sorrowful cry in common use, nearly equivalent of our Alas!).''* In spite of its many naivities this old story sounds a note of real human love and grief. Embellishments that often only serve to veil the realities of a legend, here seem to point conclusively to an actual and tragic event in the lives of a man and woman who existed in the remote past. As is customary with most native myths it has been given a definitely local setting. We find a curious confirmation of the supposition that Usai is Esau, in the word with which he expresses his grief—" Adoi, Adoi! ", for as the Hebrew *Elah* = God becomes *Eloi* = my god, so *Adoi* becomes *my Adah* and is quite simply the despairing call of Esau for his lost wife, and to this day Bornean natives use the word Adoi as an exclamation—" my Adah! " as we might say " my god!."

The plain facts of this story when the local colour that time has added is removed, are—firstly, that of a dam, built probably for purposes of irrigation, possibly across the river Jabbok (this name, meaning *river*, has a close resemblance to the Bornean Lubok) which was in the land occupied at one time by the tribe of Esau.. Secondly, that this dam broke, and with the consequent rush of water Esau's wife Adah was swept away and drowned, and it is not at all improbable that in this tradition we find an historic record of the true circumstance of her death. The Bornean legend continues as follows, and very possibly, in its main lines, gives a true account of how Esau himself met with his end.'' . . . . Usai . . . . strode down the coast to Miri, where he lived on charcoal and ginger. (The belief is widely held that the people of Miri, formerly ate charcoal in large quantities). The people of Miri seemed to him like maggots; and they, taking him to be a great tree, climbed up on him. When he brushed them off, he killed ten men with each sweep of his hand. The Miri people set to work to hew down this great tree, and blood poured from Usai's foot as they worked. Then Usai spoke to them, asking them what sort of creatures they might be, and said: ' Listen to my words. I am about to die. My brains are sago, my liver is tobacco. Where my head falls there the people will have much knowledge, where my feet lie will be the ignorant ones.' Then, his

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* H.m.D., II., 142.

being cut through, he fell with a mighty crash, his head falling towards the sea, his feet pointing up the river . . . . The Miris, of whom a thousand were killed by the fall of Usai, have beautiful hair, because his head fell in their district; but the other people have only such hair as grew on Usai's limbs."* The embellishments of this portion are not much more than customary oriental symbolism; we see the hero depicted as a giant, in comparison to whom his enemies were but minute dwarfs (the invariable method of depicting the conquered foes of ancient Egyptian and Assyrian mural decorations and in laudatory verse) but besides this he is depicted as the ancestral tree from which these Bornean tribes sprung and which is hewn down in the fight against their enemies. Then follows his dying words spoken in prophetic spirit. Even the strange style with which he begins when he says, " My brains are sago, my liver is tobacco " should, we think, be taken seriously, as the native manner of implying that by his brains—his forethought, the material welfare of his people had been secured, and by his liver—significant of his powers of divining future events, aided by the stimulating influence of tobacco, he had been able to foresee and provide for the future. Ancient tradition therefore tells us here that Esau was killed in battle, fighting his enemies. Who these enemies were it would be interesting to know, particularly as the name Miri is that of a tribe found among the Klemantans who hold this legend. It is interesting to note the mention made of the hair on Usai's body, for, as we know, from the story in Genesis, Esau was ' a hairy man " the very name Esau meaning hairy.

The Western Asiatics believed, as do the Malays to-day, that the soul resided in the liver and hence the following from an early hymn to Anu:—" May the great gods make thy heart to be at rest through concord and prayer; may they make thy liver to be at peace by prayers and bowings."† Divining from the livers of animals such as pigs, bullocks, fowls, etc., which were substitutes for earlier human sacrifice, arose out of this belief. This is no doubt long ago forgotten by most of the native tribes in different portions in the world who practise this form of divination. It is of interest to draw attention to the fact that the pig was most particularly the sacrificial animal of the ancient Canaanites as it is amongst the Bornean tribes to-day.

In the account given above of the creation of the Kalubs Angai, the dung-beetles are mentioned as aiding in the act of creating the

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* H.mD., II., 143. † W.B., I., 133.

world. This reference is too Egypto-Western Asiatic in character to be passed over unnoticed. The dung-beetle, or scarab, as is well known, played an important part in the cosmic conceptions of the peoples of Egypt and Western Asia.

The remarkable way in which some of the names of the chief Bornean tribes correspond with the names of the dukes of ancient Edom, the immediate descendants of Esau, will now be shown.

We wish to mention that the particulars given of the Bornean tribes in these pages are almost entirely derived from Messrs. Hose and McDougall's " The Pagan Tribes of Borneo."

These tribes are divided into the following six groups; of which the Sea Dayaks or Ibans, and Kayans, as having come into the island at a much later period, may be considered as separate from the Kenyahs, Klemantans, Muruts, and Punans, who would seem to be the original inhabitants. It now remains to see what evidence exists that these are of Canaanitish origin. If we refer to the O.T. we find that the 36th chapter of Genesis contains nothing but the plain matter of fact genealogy of the peoples of Edom and of the family of Esau in particular. The last verses in this chapter gives the names of the " dukes " that came of Esau, " according to their families after their places," and amongst these we find, side by side, three of the names of the tribes given above: Dukes Pinon (also written Punon), Kenaz and Teman. *Punon* and *Punan*, *Kenaz* and *Kenyah*, *Teman* and K'*leman*-tan; it is astonishing that four thousand years have not effected a greater change.

The name *K'-leman-tan* is here quite consistently sub-divided in the manner mentioned previously and would appear to mean " the *Teman* tribe " (Teman, in Hebrew, means of the right hand), and we feel doubly justified in separating *Leman* from the rest of the word Klemantan in this fashion, for in Hose and McDougall's book the translation of the beginning of an incantation is given as follows:—" O holy Dayong, thou that lovest mankind bring back they servant from *Leman*," the T having in the course of time been converted into L. Here we have the " Leman " of the word Klemantan, but given as a place name, which agrees with the quotation just made from Gen. 36, where the dukes of Esau are called "according to their families, *after their places—by their names*," and the Hebrew records also tell us of the *land of Teman*, which was in the north-east of the country of Edom. The Edomites, therefore, named their cities after their dukes, and *Punon* is marked in the maps of ancient Canaan issued to-day.

Little reference is needed with regard to *Kenyah*, which in the first place would refer to the ancient tribe of *Kenaz* (the tribe of Caleb the Kenezite already mentioned), but it is also possible that

it has come to have a double meaning and that it may in one sense stand for Canaan, the original home of the tribe, and in this resembles the name of Kenya, the East African Colony, which as we have already seen, probably also stands for Canaan.

The fourth name in this group, *Murut*, would appear to be the same as that of *Mered*. Mered was of the family of Caleb. That he was a great man is seen from the fact that he was married to a daughter of a Pharaoh (I. Chr. IV., 18.) and would therefore have been likely to be the founder of a separate tribe named after him. Closely affiliated with the Muruts are the *Kalabits* and the *Dusun*, and in the former name we see again that of *Caleb*, the ancestor of Mered, which explains the close connection existing between these two groups. The *Dusun* again may be attributed to *Dishon*, found in the genealogy of *Esau*.

Amongst the various Bornean sub-tribes is also that of the *Miri*. In Gen. XVI. 43 we find " duke " *Iram;* elsewhere in the Bible we find *Iru* and *Iri* as variations of the same name, and possibly Miri is *M'iri*, or the people of Iri or Iram. We also find Iram as a place name in Borneo.

As to the *Sea Dayak or Iban*, and the *Kayan*, the latter name strongly suggests a Semitic origin and may possibly be connected with the Hebrew work *Chayah*=live, to preserve alive. With regard to the Sea Dayak, the name Dayak is obviously the same as the Hebrew *dayyag*=a fisher, both the Bornean as well as the Hebrew word being descriptive of a life connected with the sea. They commonly speak of themselves as *Kami menoa* (*i.e.*, we of this country) which appears to be almost pure Hebrew, K'am-i Menoah= the people of this place, *menoah* meaning place, *am*=people.

We will bring this chapter to a conclusion by showing some names, chiefly place-names, found amongst the Maasai and Borneans bearing, as we believe, on their Canaanitish origin.

Maasai.	Bornean.	Canaanitish.
Sharangani (1).	Sarangani (2).	Sharon of Canaan.
Amala river.	Tamala river.	Amala in Canaan.
Kedorong.	Kidurong.	Kidron in Canaan.
Enjamusi.	Banjermassin.	Benjamin.
Kino gop (4).	Kina Balu (4).	Heb. china=comely.
Sirikwa (3).	Sirik.	
Mol*elyan* (3).	Bul*iluyan* (2).	Heb. *elyon* = most high.
	Iram.	" Duke " Iram.
Gilgil.		Gilgal.
Kishon (3).		Kishon also called " the waters of Megiddo."
Kisongo.		
Mara river.		Mara.
Elesha.		Elisha.

(1) *Sharangani*, we believe, should be sub-divided to mean " Sharon of Canaan," as has been seen in the case of the Maasai words *Mengana* and *tungani*.

(2) Sarangani and Buliluyan are not actually in Borneo, but head-lands on the coast of the not far distant Philippines. The northern-most point of these islands bears a most Maasai sounding name—Engano.

(3) Sirikwa, Molelyan, and Kishon are tribal names. The Sirikwa are or were a tribe allied to the Maasai.

(4) If we accept Kino and Kina as the same as the Hebrew *chin*=comely, these names would be " the comely land " and " the comely widow." The Kino gop of the Maasai is especially sacred to them, for it there that a large portion of the tribe have been accustomed to hold their great periodical cicumcision festivals. (*Gop*=earth, may be derived from the Egyptian earth-goddess *Kep*. " The thing which is called Naiteru-kop (=the beginner of the earth) is a God "* and in Naiteru one may possibly see the name of the female counterpart of this Egyptian cosmic deity, his wife, the sky-goddess Nut. Hose & McDougall state that Kina Balu means "Chinese widow " and that the name was given as the result the establishment of a chinese colony in northern Borneo. Is it not possible that this meaning has come to be applied at a later date and that originally this, the greatest mountain in the island, was named Kina Balu in memory of somehing in connection with the land of their origin? It is hard to believe that such an important feature in the landscape of the island should have been named or renamed at a recent date as the result of the immigration of a small contingent of an alien race.

Petrie, after having given a list of certain Canaanitish place names in his history of Egypt, adds:—" . . . . all lasting with no change—or only a small variation in vowels—down to the present day . . . . it needs no further proof that ancient names may be safely sought for in the modern map."

And to this we may add that as the British race has carried with it all over the world wherever they have founded colonies, the names of places from their home country, so also, it would seem, have the races of antiquity done in their wanderings before them.

We will now leave the Borneans for a time, and in the following chapters deal with the Maasai and other African tribes.

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* A.C.H., I., 270.

Chapter IV.

MAASAI TRADITIONS BEARING ON THEIR ORIGIN.

The traditions, collected by Merker from the Maasai, that we will now give, are of extreme interest and value, and it is remarkable that in the following story of the Dinet we should find an account which would seem to fit in so exactly with the ancient Edomites who have already been suggested as the ancestors of the present day Borneans:—

In the land of the Aroi which was intersected with canals for irrigation, lived the el Dinet. The land was thus named because of two mountains which, on account of their position, were likened to the horns of cattle. . . . . Cattle were killed in such a manner that all the blood should escape, as the people were not allowed to partake of blood, or flesh that contained blood. In cooking the meat the legs were not cut up but cooked whole. If the cooking-pots were not large enough to take the whole leg, the leg was hung with rope from the ceiling so that the lower portion could be cooked, after which it was reversed in order to cook the other half.

The men and boys shaved their heads, the women shaved only the sides of the head, leaving on the top a portion the size of a spread-out hand where the hair was allowed to grow so long that it reached down to the middle of the back. They ornamented their hair by plaiting in cowrie shells. Circumcision was not practised amongst them. . . . After the birth of a child the husband killed a sheep which he ate in company with his friends. This custom was explained thus, that the man was the primary cause of the child having come into existence, and that the wife has only borne it.

The young men did not go out to war, they only fought with the bees of which there were quantities in the land. On the trees and in number of places in the hard red earth one saw holes in which the bees lived. Each hole had its owner who had marked off his property from that of his neighbour.

The people were called to their counsels by the beating of a large drum which it took a whole oxskin to cover. Each one that sought justice brought with him larger or smaller beads (perlen) which were put down on the drum.

The name of their god was Njau, and the name of their chief was Tungasssoi.*

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* M.M., 289.

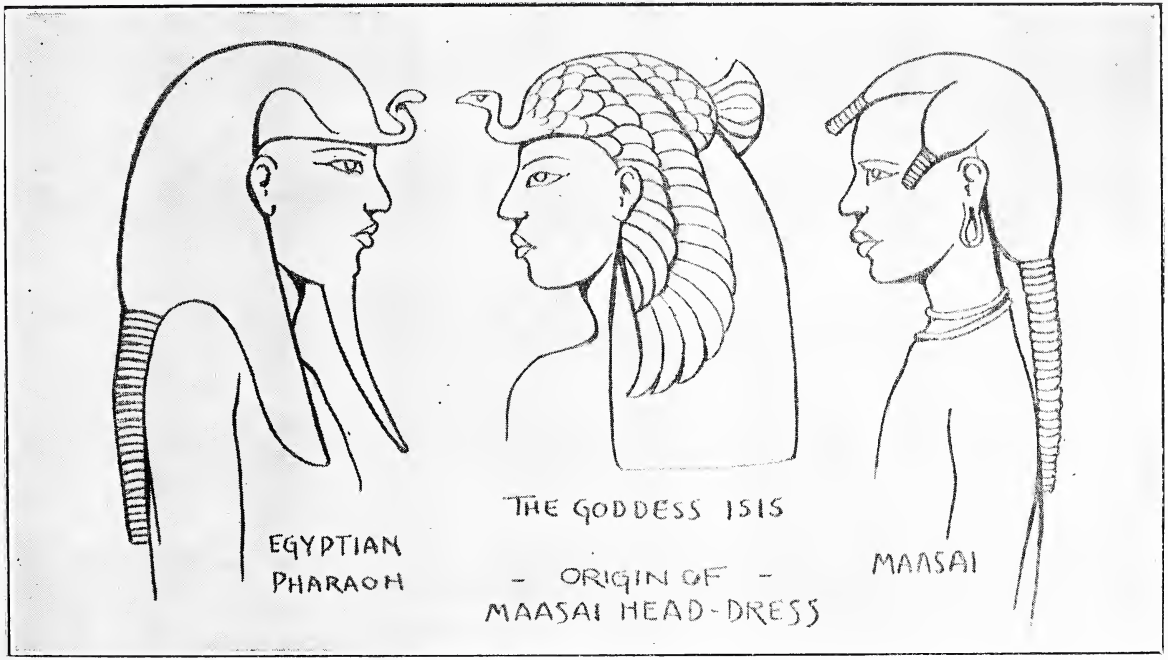
EGYPTIAN
PHARAOH
THE GODDESS ISIS
- ORIGIN OF -
MAASAI HEAD-DRESS
MAASAI

PLATE C.

At the beginning of this story the name of the country is given as that of Aroi, which is a Maasai word meaning " the ox with the crumpled horn," and that the land had got its name because of the two mountains which were likened to the horns of cattle. It is significant that the land of the Edomites was also known as the " land of Seir " which name it had got from Mount Seir within its borders. But it is also interesting to note that the position of the mountain peaks of Mount Seir and Mount Hor separated only by a narrow valley may well have come to be compared to the horns of cattle as in this Maasai story.

The name of the people, as we read, was the *Dinet*. If as is possible, the *et* of this name was a suffixed article the name itself would be *Din*, as in *E'dom* the *E* is the prefixed article and we would thus have *Din* and *Dom*. With the Borneans we seem to find this same name amongst their ancient traditions, which as will be shown later we conceive to be the same as Edom, namely *Odin or Oding*, and if we accept the O in Odin as the prefixed article as in Edom we thus have *Odin=Din* as in the *Dinet* of the Maasai. The meaning of the name of the city of Din-ha-ba in ancient Edom is obscure, could it have stod in some connection with the name of Edom itself?

The next point, that of their manner of slaughtering cattle and the prohibition of drinking blood and eating flesh containing blood is too obviously an ancient Hebrew practice to require any remarks. The following point, however, is of extreme interest and shows what may have been an ancient custom or rite which may have existed in ancient Egypt and from there been borrowed by the Edomites who were no doubt in intimate touch with the ancient Egyptians, their near neighbours. Dare we believe that this custom of cooking the leg of the ox whole by hanging it tied from the roof was ancient Egyptian custom in connection with the deified " ox-leg " of Egyptian mythology which was identified with the god Set, the spirit of evil, who had to be bound and kept in subjection, and which figured thus and guarded was represented by the constellation of Ursus Major which in early times bore the name of " the ox-leg."

The custom of the men and boys shaving their heads does not apply to-day amongst the tribes of Borneo. On the other hand, however, the mode ascribed for the women of the Dinet is exactly the manner in which the men of the Bornean tribes wear their hair, *i.e.*, shaved all round their temples and back of the head and the hair left on top allowed to grow half way down their backs.

We now come to a most interesting point in the Maasai narrative and one that is not only analagous to ancient Edomitish conditions, but which the customs of Borneo to-day help to elucidate, thus forming an interesting link between the Maasai story, Edom, and the modern

Bornean. The story says that the young men did not go out to war as they only fought with the *bees*, of whch there were quantities in the land, living in holes in the earth. Each hole had its owner who had marked off his property from that of his neighbour. That these " bees " were not insects, but were human beings, living in subterranean dwellings, is perfectly evident from the fact that special mention is made of how each " bee " had its own hole and had marked off the boundaries of his property from that of its neighbour. It is well known that the original inhabitants of the land of Edom, the Horites, lived in subterranean dwellings; modern archeological research has shown that this was the case from one end of the country to the other. That the Edomites were continually at war with these people is confirmed by the fact that they ultimately destroyed them. (Deut. II. 22). The Masai term " bees," would seem to be an ancient Canaanitish term for warriors, whose mode of warfare was that of sudden attack from hidden places; this term was no doubt applied to the Horites, on account of their living underground as do certain varieties of bees and hornets, and also because of their practice of suddenly dashing out on the Edomites from these subterranean abodes. In this respect they would have resembled bees or hornets swarming out from their hidden nests in trees or in the ground to attack intruders. Now that bees and hornets were abundant in those countries is also seen by the fact that the valley of Zoreah in southern Canaan derived its name from them, Zoreah meaning " place of hornets." These human " hornets " figure again and in the form of warriors too, amongst the present-day Borneans. Hose and McDougall say that:—" All the left-handed men are sorted out to form a party whose special duty is to ambush the enemy, if possible, at some favourite spot. These are known as the hornets (singat)."* Hornets, or those that attack suddenly from hidden places, would describe the methods of the " bees " in the story of the Dinet, and would be equivalent to those " hornets " or ambush-warriors of the Kayans. How extremely Canaanitish is both this Bornean method of selecting left-handed warriors for special, responsible duty, and also, we believe, their name for them—singat—will now be shown. It is recorded in Judg. XX. 16. that: " Among all this people there were seven hundred chosen men *left-handed;* everyone could sling stones at an hair breadth, and not miss." and again in I. Chron. XII. 1. 2. " And they were among the mighty men, his helpers in war. They were armed with bows, and could use both the right and *the left* hand in slinging stones and in shooting arrows from the bow." The Bornean word for their ambush warriors—*singat*—may possibly be derived either from the Hebrew *sene*=bush, *gad*=troop, or " bush-troops ";

* H.mD., I., 171.

or the *sin* from the Hebrew *seon* = battle, in which case the meaning would be " battle troops," or in plain English, " fighting troops." The close connection between bees and soldiers is seen too in respect of the Nandi, whose word for these are *segemya* = bee, *segein* = soldier.

The Maasai story says further that the name of the god of the Dinet was Njau, N is the article, and the name therefore is Jau whom Prof. Hommel has identified as an ancient Asiatic deity, to which reference will be made later.

The name of the chief of the Dinet was Tungassoi—Tu-'ng-assoi, probably meaning " the (man) of the Esau "; it is natural that the name of the great ancestor and founder of the Edomite race, should have been remembered and handed down in the traditions of that nation.

Two further points of interest in the preceding story are, (1) that the Dinet practised irrigation; (2) that they did not practise circumcision. We have seen in the Bornean legend of Usai and Adoi, that Usai was building a dam, this dam-building was in all probability for irrigation, and irrigation is still practised by certain tribes in Borneo. Irrigation, as we know, was practised extensively in ancient Canaan, as was natural, considering its position between Egypt and Mesopotamia, both of which countries relied principally on irrigation for growing their crops. With regard to the Dinet not practising circumcision, this also coincides with the customs of the Borneans to-day, though they hold traditions which suggest that they may have practised it in bygone ages. The ancestors of the Kayans are said to have been a gang of criminals, with mutilations in the ear-lobes and *elsewhere*.* It is known that the Edomites abandoned circumcision at an early stage in their history. The special mention of beads (perlen) as currency amongst the Dinet is of particular interest, for beads are peculiarly prized amongs the Borneans:—" Formerly these old beads were one the principal forms of currency, and still constitute an important part of the wealth of many families."†

The following account by Merker seems to give a picture of Egypt and the Delta. " There lived in the land of Gaiwos where the river of the same name formed a number of islands, the El Didity. They lived by agriculture and fishing. In their fields they planted maize and a plant named ogari, the large roots of which after having been cut into slices and dried were ground into meal. The fishes they caught either with hook and line or else in baskets.

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* W.J.P., 110. †H.mD., I., 226.

" Across the numberless arms of the river they had built bridges. Every second day markets were held when fish were bartered for vegetables. The name of their god was Se. They met at the foot of a neighbouring mountain where they asked their god for food and help.

The circumcision of girls and boys took place at puberty.

A man paid to the father of the bride eight pots of honey and worked for him for two months in his fields. After the birth of a boy the mother was not allowed to leave her hut for sixteen days. After the birth of a daughter she kept to her bed for five days. The first time that the mother and child left the hut, their heads were shaved." *

In his story the name of the country Gaiwos is very reminiscent of Goshen and in the description of the river with innumerable arms, we seem to recognise the Delta. The civilized aspect of this country as suggested by the building of bridges across the rivers, regular markets held every second day, and also the fact that the principal industries appear to have been agriculture and fishing, all point to Egypt. The name of the god Se, is also strongly Egyptian in character, and the mountain may possibly refer to the pyramids.

We should like to have given some more of these interesting traditions concerning the ancient neighbours of the Maasai, but as they do not appear to have the same direct bearing on our present purpose, we must refer our readers to Merker's book. From the Maasai traditions collected by Merker the following are of great interest as bearing on the origin of these people.

The first two human beings Maitumbe and his wife Naiterogop were placed by God in a beautiful paradise where grew all manner of fruit-bearing trees. God spake to them and said: " Of all these fruits may you eat, they are your food, only of the fruit of one tree that is standing there," God pointed to it, " you must not eat, that is my command." The two people hearkened to God and lived a happy life without care. They had three cows and a pair of goats but no hut, nor did they wear clothes. God visited them almost daily, descending from heaven by means of a ladder. One day God came down and called for the people, but they had hidden themselves in the bush. God called out and asked why they had hidden themselves, upon which Maitumbe replied " We are ashamed because we have done evil and have not listened to thy command. We have eaten of the fruit of the tree that you have forbidden. Naiterogop gave me of the fruit and persuaded me to eat, after she had eaten herself." On God asking Naiterogop why she had eaten contrary to his command, she

* M.M., 299.

replied that the three-headed serpent came to her and told her that if she ate that fruit she would be like the god and become almighty like him." God was angry at this and said to the people: " As you have not hearkened to my command, you must now leave paradise," and turning to the serpent he said: " And as your punishment you shall live for ever in holes in the ground." With these words God turned quickly round and walked back into heaven. The morning star was sent to turn the people out of paradise and was placed there to keep guard.*

The story tells further that these first people had three children, and goes on to recount how a number of present day customs originated. They are however so mythical in character that they have no particular bearing on the present argument. An account of the first murder is given, no doubt a tradition of Cain slaying Abel. The account of the flood is interesting, and bears a stronger resemblance to that of the Pentateuch than to the early Babylonian version.

The account of the giving of the ten commandments is so truly Israelitish that it must be give in detail.

One day the Maasai heard on the mountain of God a whirlwind and a shout, and running up to it they heard, coming out of a cloud on the top of the mountain, the following words shouted:—" God has sent me to tell the Maasai ten things. To-morrow I will come back and then all the elders must be here." The following day, early, the elders collected at the foot of the mountain and went up it together. Having got a good way up the mountain they heard a loud voice calling to them to halt. As they looked at the top of the mountain, they saw a being in the shape of a man who had however two large wings on his back like a bird, but only one leg. To be able to move with only this one leg the angel carried a pole in his hand, which he used in walking as a jumping pole. The old men spake:—" Olotu en diriman "=" He comes with a crutch " and gave him the name of Ol dirima.

When the elders had thrown themselves on the ground the angel spoke:—" God has sent me to say ten things to you.

(1) There is but one God. He has sent me here. Up to now you have called him E'majan or E'magelani: from this time ye shall call him N'gai. Ye are not to make yourselves an image of 'Ngai. If ye follow his commandments all will go well with with you, when however ye do not hearken, he will punish you with famine and sickness.

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* M.M., 271.

(2) When ye go to fight with the El meg ye are only to strike with sticks or shoot with the arrows of wood without iron points; ye are to use no knife because God has forbidden that you kill a man, and he will punish you severely if you do not hearken.

(3) Each one is to be content with what he has, and must not take what belongs to another Maasai.

(4) You must be merciful to one another and not fight with one another. Only old men may drink honey beer, as the younger become drunk with it and elated and then begin to quarrel and to fight.

(5) No warrior or youth, no unmarried man, may touch the wife of a married man.

(6) When a Maasai has lost any of his property, then shall the other Maasai support him; when he has lost it all he shall receive something from each one, so that he soon may become well off again. . . . . .

(7) Only one shall rule over you; him shall all hearken to. Disputes are to be settled by a council of old men.

(8) A man must never have more than one wife at a time; first when she is dead or parted with may he marry another. . . . .

(9) You shall kill no female animal, nor any bulls, nor he-goats, nor donkey stallions. Only cut male animals may ye kill for for food.

(10) You are every year on the eighth day of the ninth month to keep the Kudjarok to the honour of God, with burnt offerings of the good smelling " os-seigi " wood, for which God will keep away from you plague, famine, and sickness. . . . . .

When the angel had spoken these words, a cloud sank down over the mountain and hid him from the sight of the elders. These now left the mountain and went back to their kraals, where they told what they had seen and heard.*

Of extreme interest in this account is the description of the deity with one leg who used a crutch to help himself along. The exact equivalent is found in the description given of the Nandi evil deity or devil which they call Chemosit, who is said to be half man and half bird, to have *only one leg* and to *propel himself by means of a stick which resembles a spear and which he uses as a crutch.*† (See frontispiece).

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* M.M., 279. † A.C.H., II., 41.

The account given above, does not mention Moses but nevertheless he makes his appearance in Maasai traditions as a lawgiver; he is called Musana, and Merker says of him that in physique he was a dwarf, despite which he wielded a very great influence over his people. He introduced the week of seven days, the reckoning of which dated from the new moon. On the day before the seventh day the people gathered together under the shadow of a tree in the neighbourhood of the kraal, and nine cattle were slaughtered and eaten, and honey beer was drunk, but only by the old men and ol aigwenani (this describes a communistic sacrificial feast as practised in the heathen religions, such a thing did not occur under the Mosaic law). After this feast the people returned to their kraals, but collected again the next day for instruction on the following three points.

(1) The unmarried men must sleep in their own kraals and not in those of the married, so that they cannot come to the married women. The warriors are not to go out to war without the permission of the ol oiboni.

(2) No breeding animals but only castrated animals may be killed for food.

(3) No one may take what belongs to another. Those who are in need have to be supported. God gives friends to the good people, who willingly help them.

The importance that Musana and those of his time attached to these teachings can be seen by this seventh day being called Esubat 'n olon = the good day.*

Esubat 'n olon means thus in present day Maasai " the good day," but *Esubat* is so like the Hebrew *Shabbath* that one cannot doubt that these words are derived from the same source. And more especially so when one considers the *olon*, which is also the Maasai for sun. We believe this word to be derived from the Hebrew *elyon*, meaning " most high," which is equally applicable to *olon* as sun (*Eng-golon* = the power, authority), and to *Esabut 'n olon* which would thus come to have had the original meaning of " The Sabbath of the Most High," which is exactly the sense in which it stood to the ancient Israelites, and stands to the Jew of to-day. This is an extremely interesting example of how words can have come to acquire an entirely altered meaning in course of time.

Eng olon = the sun, is, curiously enough, like Engai, feminine; but their word for the moon, *ol aba* is masculine, and would seem to be the same as their word *baba* = father—in the dialect of the Dorobo, *aba*—and is most evidently the same as the Hebrew

* M.M., 282.

ab = father, which in Aramaic is *abba*. This is a curious reversal of the usual order, which it would be interesting to have explained.

In the Maasai legends given by Merker, Moses appears under different names, of which the more important are, Marumi and Musana. Marumi's father, according to Maasai tradition was Geraine and he had also the name of Eramram, meaning " stutterer," which was apparently a name common to his whole family, as stuttering was a hereditary failing. In Exod. we find that the name of the father of Moses was Amram which is almost identical with Eramram. The Maasai Geraine was said to have two other children besides Marumi—the son Labot, would correspond to Aaron, and the daughter Meria would correspond to Miriam, the sister of Moses and Aaron. It is interesting to note in connection with the meaning of the family name Eramram, that Moses, when bidden to rescue the children of Irael from the tyranny of Egypt, protested his inability and incapacity for such a task on the ground of being " slow of speech, and of a slow tongue." (Exod. IV. 10).

All who have come in contact with the Maasai have remarked on the exclusive and aristocratic attitude of this tribe. They regard themselves as a special and sacred people, and have no doubt whatever of their inborn superiority over every other race. Intermarriage with other tribes is practised but little, and the women of the despised el meg " negroes " are not taken into the tribe; when raiding their neighbours they only carry off their cattle and do not take away their women folk. Having seen how they have kept true to their traditions in other respects, it is only fair to assume that through the ages they have kept rigorously to this custom and that they have not intermixed to any appreciable extent with alien blood.

Even their attitude over the cattle raiding question, to which we are about to refer, naive and not a little humorous as it appears to us, is but another proof of their assurance that they are the Creator's chosen people. How ancient is the tradition that they are cattle raiders is seen in I. Chron. VII. 21. " And Ezer and Elead, whom the men of Gath, that were born in that land slew, because they came down to take away their cattle."

Another proof of the high opinion that they have of themselves is shown in the way that they have adopted so many of the insignia of the Pharaohs, and in particular the symbols of their divinity; their mode of doing their hair in similar style to that of the large wig of the Pharaohs, the skin coats of their elders represent the cobra's hood. Even the lion-skinned head-dress worn by their warriors has its equivalent in the lion-mane fringe seen on the statues of the war goddess Sekhmet. It seems only reasonable to suppose that this belief in their divine origin and their right to assume all the peculiar

insignia of royalty and divinity, is a perverted tradition founded on their original conditon as part of the chosen people of Jehovah.

These characterstics of the Maasai are described by Merker as follows:—" The most prominent trait in the character of the Masai is his natural pride, which is founded on their religious outlook by which they are the chosen people of God. God has made the world and all that is in it only for them, all that are not Masai are subject to them, and their property belongs to them. From this comes their pride and their profound contempt for the non-nomadic (ansässigen) negroes, who do not know 'Ngai, and who have no right to what has been created by him and who therefore are condemned to get their daily sustenance by working in the ground. God cares however for the Masai as for his children, they need not work; 'en dobira meti sidai = work is not good, all belongs to them, and when the negro will not give it up freely then the Masai take it by force. The negro has on the whole only one justification for existence in the eyes of the Masai namely as the keeper of the cattle that 'Ngai has created for the Masai. ' The Masai call all non-Masai in general terms—el meg (S. Ol megi) a word that should be translated, " unbelievers." The Masai know neither friendship nor faith towards the unbelievers, and any form of deception and cunning is permissible towards them. Their names for the tribes related to them by race are derived from the names of the districts which they inhabit, and in this connection it must be noted that the Masai have their own names for the latter. He uses for the European the term derived or reconstructed from Kiswahili 'l aisungu. And lastly, he calls the negro el manat (S. ol manatinda) the meaning of which approximates to " the savages " and is equivalent to the word Washenzi, by which the coast people denote the negroes of the interior."*

" When they go to war against another tribe, to plunder, they are only taking what belongs to them by right, and what God has given them as their own, and what other tribes are unrighteously withholding from them. ' If the *el meg* would only voluntarily give up to us our property, our cattle that are in their possession, we would not need to go to war with them. As, however, they will not do that we are obliged to fight them. And they make these wars against the depised heathen that do not know 'Ngai and do not pray to Him, but only to spirits, on which account He does not stand by them, and always gives the victory in the righteous cause to the Masai."† Hollis gives us much the same picture, and the following quotation again shows their assumption that they are by no means the barbarians

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* M.M., 116. † ID. 204.

that they consider their neighbours, the Bantu people, to be. " If a small child yawns, his mother grasps his mouth between her fingers to prevent it from stretching and becoming big like the savages' mouth."*

The traditions again concerning the elders of the Maasai suggest an Israelitish origin. Merker (283) says that the first ol oiboni was Kidonoi, the founder of the family of *en Gidon*, and he belonged to the clan of *L'aiser*. The name of Kidonoi means in Maasai " the one with the tail," for as the story goes he had a tail a hand span in length. Here are thus two names for the judge Gideon of Biblical fame, one of which seems to bear a rather distorted meaning. In this lies a confusion that is not however difficult to explain. Similar to Gideon we find in the Hebrew the word for wizard=yiddeoni. Now these wizard were the wise men or prophets of their heathen deities. That these wizards were associated with the idea of tails is quite likely, for we find the Pharaohs and Gods of Egypt depicted with tails, and the tail was evidently to the pagan people the emblem of superior and divine knowledge. This was recognised by the Hebrews, as seen in Isaiah VI. 14. " Therefore the Lord will cut off from Israel head and *tail*, branch and rush, in one day. The ancient and honourable he is the head; and the *prophet that teaches lies, he is the tail.*"

Gideon the great hero judge, of the tribe of Manasseh, renowned for his knowledge and wisdom, had become with time and their relapse into heathendom, as we see, a great " wizard "-prophet, whom they picture with a tail, no doubt having forgotten the symbolic meaning of this appendage.

The *ol oiboni* of the Maasai is held in repute not only for his superior wisdom, but also for his prophetic powers. He is by no means the common witch doctor of most other African tribes, his position is far more that of the chief elder or judge in ancient Israel, and combines with this, what is perhaps his chief attribute, that of prophet. *Hollis I., 326* tells how Mbatian, the greatest of all *ol oibonok* of more recent times, prophesied, before ever Europeans came to the country that white people would arrive.

Another point which suggests the Hebrew origin of the *ol oiboni* is that he does not cut his beard, for by so doing he will be deprived of his supernatural powers. This reminds us of the story of Sampson, who as a Nazarite was forbidden to cut his hair, and when eventually this was done, his strength departed from him. And again, the

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* A.C.H., I., 334.

ol oiboni lives only on milk and honey (cp. Is. VII. 15. " Butter and honey shall he eat, that he may know how to refuse the evil and choose the good."). To this diet roast goat's liver only is added, no doubt to increase his powers of divination, as the livers of animals are usually associated by pagan peoples with omens, augury, and divination.

The word *oiboni* (usually translated medicine-man) is possibly derived from the Hebrew or Aramic *ab* = father, chief, and *oni* may be the suffixed pronoun as in the Aramaic *rabboni* = my master, and *oiboni* would thus mean " my father " " my chief." The Maasai term for surgeon—*ol abani*, bears an even closer resemblance to this possible derivation. A and O are sometimes interchangeable in Maasai. Aramaic, closely allied to Hebrew, was, as the " lingua franca " of Canaan and Syria, the everyday speech of the peoples of those countries, and papyri found from the Jewish occupation of Elephantine, are written in this dialect.

The *oibonok* are all said to belong to the Gidon family, the founder of which was Kidonoi, identical, as we have seen, with Gideon of biblical fame. Mbatyan and his son Lenana claimed their descent from Kidonoi, who was the son of Sigiriashi, the son of Ol Mweiya. The pedigree from which these names are taken contain several others, which, however, are of more recent date. With regard to the names now given Merker states that they are from their earliest history, when these men held the position of chiefs.* That many and wide gaps exist in the pedigree is quite apparent, and only the most outstanding names have been passed down through the ages. When, therefore, it is claimed that Kidonoi (whom we have already discussed), was the son of Sigiriashi, this in reality merely refers to his being his direct descendant and " son of " is frequently used in this particular sense in the O.T. In Sigiriashi, we have the not uncommon Biblical name Zechariah. Now the donkey of the Maasai rejoices in the same exalted name, being called Sighiria, which was possibly the name by which this animal was known colloquially in ancient Palestine, for the meaning of the word Zecharia is " whom Jehovah remembers," and the donkey was particularly remembered in the Mosaic law, as its first-born was exempt from the law enforced with regard to all other domestic animals, namely, that the first-born must be sacrificed to Jehovah. The name Sigiriashi, however, would mean—*ish* being Hebrew for man—" the man whom Jehovah remembers," and as we will now show we believe it be a paraphrase applied to the patriarch Jacob, who was also known as Israel.

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* M.M., 19.

It is recorded that Sigiriashi was the brother of Ol Oimooja and that they were both the sons of Ol le Mweiya.* Here is one of two brothers of whom the one was " the man whom Jehovah remembers." We find a parallel to this in the Hebrew record of Jacob and Esau, the former of whom was especially remembered by Jehovah, and became the father of " His chosen people."

Having thus identified Sigiriashi with the patriarch Jacob, Ol oimooja would therefore be his brother Esau. The father is mentioned as Ol le Mweiya, but we believe him to be not Isaac but Abraham, for in another Maasai tradition told by Hollis we find that one Le-eyo on his death-bed gave the birthright to his younger son, who became the father of the Maasai, as in the Biblical account Isaac conferred the blessing, and with it the birthright, on his younger son Jacob.

Now Merker says that Maasai traditions record that in the days of this Sigiriashi they left the land of their origin and came into Africa, but this cannot refer to the migration that brought them to their present abode, for that occurred long after the days of Gideon=Kidonoi, who was a descendant of the Sigiriashi to whom this Maasai tradition of an emigration refers. But it tallies most accurately with the historical fact that the Israelites in the days of the patriarch Jacob, whom we identify with Sigiriashi, emigrated into Egypt, *i.e.*, into Africa.

In the historical review, in the second chapter, we have shown how the term Automoli of Herodotus is evidently a collective name for a group of peoples who, as troops, deserted " en masse " from the frontier fortress of Elephantine and migrated down into Africa, south of present-day Abyssinia. It has also been shown that Automoli is the same as the Hebrew Semol or Semali—those of the left-hand side, and that the African Somali of to-day would seem to be a portion of these Automoli. Our assumption that the Somali are ancient Hebrews, is further confirmed by the Masai name for them, that of Sigiriaishi, which, as Sigiriashi is the same as Jacob or Israel, " the man whom Jehovah remembers," would make these people—paraphrased as " the people whom Jehovah remembers "—Israelites.

In the introduction to Hollis' " The Masai " Sir Charles Eliot mentions as remarkable the phrase used by the Masai " The highlands and lowlands of our vast country which belongs to our god." The origin of this phrase we find in I. King. XX. 22-30.; in verse 28 we read " And there came a man of God, and spake unto the king of Israel, and said, Thus saith the Lord, Because the Syrians have said,

* A.C.H., I., 325.

The Lord is God of the hills, but he is not God of the valleys, therefore will I deliver all this great multitude into thy hand," and immediately previous to this in verse 23 " and the servants of the king of Syria, said unto him, Their gods are gods of the hills; therefore they were stronger than we; but let us fight against them in the plain, and surely we shall be stronger than they." The result of the battle was that the Syrians were severely beaten. It is evident from this that the Israelites even in those old days, claimed that their god was " The God of the highlands and lowlands of their country." But the Syrians also it would seem claimed the same with regard to their country and their gods, and a strong feeling of rivalry evidently existed between the two nations; each upholding the honours that they thus claimed for their respective deities in this matter.

In the Bornean story of Usai and Adoi, it has been seen how the latter name has also been preserved by being used as an exclamation— " my Adah! ". An equivalent to this is found amongst the Masai, who speed their parting guest with the word *Esai*="so be it."* Here we have the Hebrew *Esaiah* meaning " Salvation of Jehovah " which is the equivalent of our " good-bye," which is derived from the form used by our forefathers " God be with ye." The Maasai have forgotten the original meaning of their Esai, and so would we for our " good-bye," had it not been recorded in our written documents. The equivalent form of taking leave amongst the Nandi is *Saiseri*=our Good-bye. Here is the same *aiser* as in the Maasai clan name *L'aiser*, which has been shown to mean originally *help* from the Hebrew *ezer*; and seeing that the Maasai *Esai* in all probability meant " Salvation of Jehovah " we may assume that Saiseri meant " God help ye."

Again, in the following one sees Semitic traditions. Hollis relates that:—" The warriors are fond of the titles *'l-oingok* (the bulls) and 'N-gaminini (the generous people). . . . . Now to become one of the *oingok*, a warrior must kill savages, whilst the *gaminini* are chosen if they frequently slaughter bullocks and give the meat to their comrades."† The term " bull " signified amongst the ancient Semite races " Mighty ones "; this is shown symbolically in the Assyrian reliefs of bulls with men's heads. A Hebrew term for bull was also *abbir* meaning " Mighty ones." This term bull was also used by the Egyptians, and Seti I. was described as " Mighty bull, ready-horned, mighty-hearted, smiting the Asiatics, beating down the Hittites, slaying their chiefs." *Gaminini*, again, must be derived from the Hebrew *yamin*=right hand, and *gaminini* would thus mean one who gives generously with his right hand. The

* A.C.H., 1., 287. † ID. 298.

complete opposite to this is found in the Maasai for theft, *'Nyamin*, and here we have the pure Hebrew *yamin*, but how it has got this meaning, is more difficult to see.

It will be shown in the next chapter how astonishingly the Maasai have retained ancient traditions in the case of their head-dresses. We wish however to point out here what we believe to be two other of the insignia of Egyptian divinity that they have adopted.

The manner in which several of the " Hamitic " tribes have appropriated to themselves the divine attribute of the beard of Osirian divinities, will be dealt with more fully in a following chapter,, where we have suggested that the lip-ornaments of these people were derived from this source, being intended to denote the divine descent of the wearers, as also on account of the magical and fertilising powers with which they possibly credited them. Another custom that we venture to trace to the same origin, *i.e.*, that of identification with the deity, is the curious custom amongst these " Hamitic " tribes, and which has so often been remarked on, namely that of resting, standing on one leg, and supporting themselves by means of their spear. The one-legged characteristic of the angel in the foregoing account of the giving of the ten commandments has been seen. This one-legged peculiarity was also noted in the devil Chemos of the Nandi, to which further reference will be made later. In both cases they were said to support themselves on crutches. The origin of this one-leggedness is no doubt derived from the Osirian deities of Egypt, who were so often depicted in a manner which gives an impression that they were one-legged. *See illustration of Chemos in frontispiece.* The Pharaohs, also assimilated this characteristic as Osirians. This one-legged aspect of the Nandi Chemos and the Maasai angel arose, no doubt, from a misunderstanding of the real meaning of the representation of the Osirian gods, swathed as mummies; in many instances the illusion of one-leggedness is very complete. That strangers, refugees, not deeply initiated into the mysteries of the Egyptian cults, would have accepted the divine attributes as depicted, at their face value, is easy to understand, and that in this fashion the " Hamitic " tribes of Equatorial Africa accepted these divine attributes in a literal sense and applied them to themselves as a divine race. The crutch too, which they seem to have identified with a spear, is probably the spear or standard with which the " one-legged " Osirian deities were often depicted, and it certainly bears a strong resemblance to a crutch.

We find that amongst the Maasai, the smiths constitute a special caste, and are known as *kunon*. No inter-marriage whatever occurs

with this caste, and no Maasai will take the daughter of a smith to wife, nor can any *kunon* marry the daughter of a Maasai. They are distinctly a pariah caste, and this is consistent with the conditions of the smiths in ancient Egypt, and, we believe, too, in Western Asia. Merker, we believe quite correctly, identifies the word *kunon* with the Hebrew *kenan=smith*, and thus connects them with the Kenites. These people inhabited the northern part of the Sinaitic peninsula. Here a certain portion of them joined the Israelites on their return from Egypt and went with them into Palestine:—" And the children of the Kenite, Moses' father-in-law, went up out of the city of palm-trees with the children of Judah, which lieth in the south of Arad; and dwelt among the people." Jud. 8. 16. The Kenites are believed to have been a tribe whose chief occupation was that of smiths, and Professor Sayce speaks of them as follows:—" Separate from the Edomites or Amalekites were the Kenites or wandering ' smiths.' They formed an important guild in an age when the art of metallurgy was confined to a few. . . . . The Kenites were, in fact, the gypsies and travelling tinkers of the Oriental work. . . . . The art of working iron was one which required peculiar skill and strength, and the secrets it involved were jealously preserved among certain nomad families. As culture advanced the art became more widely known and practised, the Kenites ceased to have the monopoly of the trade, and degenerated into mere nomads who refused to adopt a settled life. Their very name came to disappear and their stronghold in the southern desert was wasted by the armies of Assyria. The Kenites, it will thus be seen, did not constitute a race, or even a tribe. They were, at most, a caste."* Amongst the Egyptians, and no doubt also amongst the Western Asiatics, the smiths constituted a separate caste who could neither marry outside their own body nor could anyone marry the daughter of a smith. That the Hebrews did not regard the Kenites as pariahs, probably on account of their Semitic blood is evident from the fact that Moses married a Kenite, and no tabu existed concerning the Kenites or smiths under Mosaic law. When, later on, the Israelites adopted the heathen religions of their Canaanitish neighbours, they probably also adopted the superstitions relating to the smith, when these people would consequently have become the pariah caste as they were under heathen religious law. Now as the smiths were a separate caste with which others could have no social dealing in ancient days, so to-day amongst the " Hamitic " and other tribes of Kenya Colony, they all have the pariah " smith " castes with whom no sort of intermarriage or social traffic can come in question.

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* A.H.S. I. 175.

Chapter V.

RELIGIOUS BELIEFS AND CUSTOMS, ETC., OF VARIOUS CENTRAL AFRICAN TRIBES.

As we remarked in the introduction, when considering the customs of these African peoples in general, one is impressed by the fact that they are living under an equivalent to "Mosaic" law; ceremonial customs, rites and prohibitions, meeting one at every turn. Dryberg in his book "The Lango" makes the following very true statement:—"It cannot be too often emphasized that religion is a much more important factor in the secular life of primitive peoples, than it is with civilized communities—indeed it is the most important factor of all. It enters into all their family and social relations, into their most commonplace activities and their daily occupations—in short, there is no aspect of native life which has not its religious significance and which is not more or less controlled by the religious rites or prohibitions."*

We by no means intend to deal here with the details of this highly organized system amongst native tribes, or even to describe it in a general way. The object in these pages, is, by selecting the most striking similarities, to endeavour to show that they derive their origin from sources of historic antiquity.

In earlier chapters the origin of the Masai deities has been traced; we will now proceed to consider those of other tribes.

The Nandi are particularly interesting as they are sunworshippers, the only tribe (together with their sub-tribes) in this portion of Africa who are so. This points strongly to a Canaanitish origin, for sun-worship was the typical form of religion amongst the Canaanites and the other Semitic peoples of Western Asia. The god of the Nandi is the sun, which they call *Asista*, or, without the article *Asis*. In approaching the question of their religious beliefs, Eliot, in his introduction to Hollis' "The Nandi," suggests the possibility of the relationship of these people to Semites.† The Nandi are in physical type, character, language and customs, recognised as closely allied to the Maasai and we believe them to be ancient Semitic Canaanites, though not Israelites. A strong indication of their Canaanitish origin is suggested by their name for Devil—*Chemos*, with the definite article—*Chemosit* (chemosit=the devil—one-legged devil. Hollis).

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* J.H.D., 233. † A.C.H., II., xix.

PLATE D.

Ancient Egyptian Boatmen.

Inset 1: Amenhetep IV. Inset 2: Modern Wakikuyu.

This *Chemos* we believe to have been originally the same as the sun-god of the ancient Moabites—*Chemosh*, who on his passage through Egypt was degraded to an evil deity, the more humane form of sun-worship practised in Egypt having been accepted in his place. A similar change seems to have taken place in the case of another Canaanitish deity. The malevolent spirit of the Balenga of N.E. Rhodesia is *Molechi*. The resemblance here to the Canaanitish *Moloch* or *Molech* is too obvious to need any reference. The character of the present day Chemos of the Nandi has changed but little from that of the Chemosh of old, to whom the first-born children were offered as human sacrifices, his name meaning " fiery " or " hearth "—very significant of the form of sacrifice his worship demanded. The memory of this monstrous practice would seem to live to day in the character in which the Nandi devil Chemos is represented. Hollis describes him as follows:—" There is also a devil called Chemosit, who is supposed to live on the earth and to prowl round searching to devour people, especially children. He is said to be half man, half bird, to have only one leg but nine buttocks, and his mouth, which is red, is supposed to shine at night like a lamp. He propels himself by means of a stick which resembles a spear and which he uses as a crutch."* (*See frontispiece—reconstruction of Chemosh*). How the Canaanitish deities Molech and Chemosh could have become degraded from the position of gods to that of devils, is not difficult to understand. On their passage through Egypt the people who held this form of worship would have accepted, as we have said, the more humane form of Egyptian sun-worship, and Molech and Chemosh, the deities who had made such terrible demands on human life, and primarily on the lives of their first-born children, would have become their evil gods—their devils. It is of interest to note that the Canaanitish Baal was identified in Egypt with the god Set, the evil deity of the Egyptians. Baal, Molech, and Chemosh, were all three gods of the same character.

The Nandi name for sun—their supreme deity—*Asis* is probably a confusion of the sacred *Apis* of Egypt with *Osiris*; this cult would naturally have appealed to a pastoral, sun-worshipping people.

The Canaanitish origin of the malignant spirit of the Balenga (in N.E. Rhodesia), has just been referred to and it would seem that the benign deity of this people, *Leza*, is also of Canaanitish origin. *Leza* may possibly be derived from a Hebrew word meaning " the god who helps," just as *Abi-ezer* means " father of help," but *Azar* or *Ezer* is mentioned in Hasting's Encyclopedia of Religion and Ethics, under " Canaanites " as the term for a deity in ancient Canaan. They also

* A.C.H., II., 41.

possess another deity—*Songa*, who, on the strength of the striking similarity of the other two to Canaanitish deities, we venture to identify with *Onca*, who figured in the pantheon of Phœnicia.

Having noticed the existence of the name Moloch in N.W. Rhodesia, we are going to venture a theory as the origin of the supreme god of the Bantu known in Kiswahili as Mungu, of which the Mulungu or Muluggu of the Kikuyu and Akamba is a variation. We believe him possibly to be no other than the Western Asiatic *Moloch*, whose pedigree would have come down as follows: *Moloch—Molochi—Muluggu—Mulungu—Mungu.*

With regard to the origin of the Maasai god 'Ngai, Merker speaks as follows:—" According to Hommel (Prof. dr. F. Hommel: " Die Altorientalischen Denkmähler und das alte Testament. II. Auflage.) Ai is the oldest term for the moon-goddess amongst the Western Semites, whose cult of the moon was practically montheism. Long before Moses had brought in the official name for God, Jahveh, Ai and Jau existed as other names (Nebenformen) of the same meaning for the supreme deity. As the name for God in the Masai, 'Ngai shows the feminine form, so also was the Ai of the Babylonians of feminine gender."* This *Ai* seems also to have been worshipped in Heshbon to the east of the Jordan by the Ammonites, and was evidently their female deity by the side of their sun-god Melcom. *Jau* appeared, as we have seen, in the Maasai story of the Dinet, given by Merker.

The Taveta people, a tribe allied to the Nandi and Maasai, call their deity *Izuwa*,† which name seems to resemble the Hebrew Jaweh. Izuwa is also their name for the sun, which, like the Nandi, they worship.

Besides their supreme deity Asis, the Nandi have a vague conception of another deity of a dual character, called *Ilet-ne-mie* and *Ilet-ne-ya*, the traditions concerning which are similar to those of the Maasai black and red gods. Sir Charles Eliot, in his foreword to Hollis' " The Masai," suggests that this may have been borrowed from the Somali *Ilahe*, but from what has been shown here as to the probable Canaanitish origin of these tribes (including the Somali), it is nearer to hand to take the Hebrew *Elah* or God, as the direct source from which they are derived in each case, and to which may also be ascribed the *Elat* of the Suk, a neighbouring tribe of the Nandi.

The Jaluo, a Nilotic tribe which, it seems, belongs to the same big group as the Nandi, call the sun *Chieng*, and appear to have

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* M.M., 342. † A.C.H., II., xix.

worshipped it up to a fairly recent date; this word is strikingly similar to the Canaanitish Chiun who was a Phœnician deity and is also mentioned in Amos V. 26. The word amongst the Jaluo for god is *Nyasai*, and as *Ny* is the article, the name of the deity is *Asai*. It seems here as if we have again to deal with the deified *Esau*, the *Usoos* of the ancient Egyptians and Phœnicians, and the Tung*assoi* of the Maasai account of the Dinet.

The following names, all of which appear to be of Canaanitish origin, and are all names of deities, benign or malevolent, are most striking evidence in support of the assumption that many African tribes may be of Canaanitish origin. *Ai*, *Jau*, *Molechi*=Molech, *Chemos*=Chemosh, *Izuwa*=Jaweh, *Leza*=Ezer, *Songa*=Onca, *Chieng*=Chiun, *Nyasai*=the Esau, *Ilat*, *Elat*, *Ilahe*=Elah.

The sanctity of the wild fig-tree, in which, as has been seen, in ancient Egypt the spirit of the divine Hathor was supposed to dwell, and from which she sacramentally administered the elements of life, just as when in her other form, that of a cow, she gave her divine milk, is a conspicuous feature in the animistic beliefs of many African tribes to-day. The sacramental characteristics of this tree are well illustrated in the following picture given by G. Lindblom of an Akamba practice, and occurs amongst the ceremonies connected with their circumcision. A wild fig-tree is selected by the elders, who act as initiators to the candidates, and they go to the fig-tree and pray " Fig-tree we have come to pray thee to give us milk-juice for the Asiggi," the *assigi* being the circumcision candidates. An offering of a little food and milk is made to the tree and a little fat is smeared on its trunk. The tree is pricked with a sharp instrument, and the exuding juice is caught in little calabashes and the *assigi* pretend to drink it and thus imbibe the milk of life from the tree.

In his chapter on sacrifices C. W. Hobley tells of this sacred fig-tree and the custom of the Kikuyu, who " sacrifice at the sacred fig-tree, or mugumu, which is always intended as an act of communion with the deity or high god called Engai."* A description of a sacrifice at one of these sacred fig-trees (Ficus capensis) of which he was an eye-witness, is worth recording here:—" The elders " (one can almost call them priests, as he says a little further on) " first took some sugar-cane and poured a little on each side and in front of the tree, praying at the same time. The sacrificial ram was then strangled, held up before the tree, and its throat pierced. The blood was collected in a cow's horn and a little poured on each side of the tree and allowed to trickle down the trunk. At this stage of the proceedings another prayer was uttered.

* C.W.H., 40.

" A strip of skin and fat running from the throat of the carcase down to its belly, and including the genitals, was then cut off and hung up on the small branch projecting from the tree. The elders now prayed again. After this the ram was dismembered and the feast took place. The reality to these natives of the existence of this tree-deity is well shown in the following prayer of the officiating elders:—" Mulungu, this is food. We desire rain and wives and cattle and goats to bear, and we pray god that our people may not die of sickness."*

How widespread throughout Africa is this ancient and forgotten cult of Hathor, can best be understood by studying the various native head-dresses. The sacred symbols worn on the head of this famous deity are found to-day on the head of the native from almost one end of the continent to the other. The illustration here shown, Pl. A. of the head of the Hathor cow, shows the horns, symbolic of the new moon of this queen of heaven, the ostrich-plumes, and the disc of the sun, the emblems of life.

The horns and feathers of Hathor are most clearly seen in the warrior head-dress of the Zulu, where the bullock horns are set in a crown of ostrich feathers. Horns are sometimes introduced into the crown of ostrich feathers worn by certain Kavirondo peoples of Kenya. Another form symbolic of the Hathor horns is seen in the way the Bushongo of Congo grow their hair to resemble buffalo horns and also how the Jaluo place the tusks of the wild-pig in their head-dresses.

Pl. C. shows the soul-bird as worn on the head of the goddess Isis. This soul-bird, when depicted on the heads of the female deities, was represented by *a vulture*. The large wig of the Pharaohs was further a conventionalized form of this same bird head-dress of the deities, Pl. C. The most perfect picture of this ancient Egyptian bird-wig is the coiffure of the Maasai, and is worn in varying forms by the Nandi and other Nilotic tribes. In some cases an actual wig is worn, which is put on for special occasions. Pl. C. illustrates this Maasai head-dress. This illustration will best show how faithfully the traditions of this wig of the Egyptian deities have come down through the ages. The head, the protecting wings, the tail, are all still there to-day, and the style of plaiting is identical too with that often found on ancient Egyptian statuary. But perhaps even more interesting is the Maasai warriors' head-dress Pl. B. The origin of this head-dress is best explained by the plate. It is nothing else than the fringe of mane worn round the face of the Egyption lion-headed

* C.W.H., 54.

goddess of war, Sekhmet, who was identified with Hathor and also with the Canaanitish Ashtart, and as we see this head-dress in the same plate, repeated again in the Sphinx statue from Tanis of the Egyptian warrior king. On the picture of Sekhmet it will be noted that this fringe of mane is placed round the lion-face, over the regular Egyptian wig. In the case of the Masai this head-dress is made of lion-skin and fringed with ostrich feathers.

The small Egyptian wig is also found widely used amongst the natives of Africa as the " motif " of their various methods of dressing the hair. This wig was worn both by the Pharaohs and the lower ranks. Pl. D illustrates this wig as used by the common people; inset 1. shows Amenhetep IV. wearing the same wig, and inset 2. depicts the modern Kikuyu mode of hair-dressing, which, as will be seen, is identical with the ancient wig. The knotting of the hair in this fashion was intended to represent the feathers of the soul-bird, and until recently this tradition of the feathers of the soul-bird, was sometimes even more strongly emphasised by the Kikuyu, who plaited feathers, preferably those of *the vulture*, into their hair. The Nandi again, whilst their hair is growing after it has been shaved for ceremonial reasons, sometimes fasten a small, spiral-shaped tuft made of a *vulture* feather at the back of their head. The Kikuyu mode of hair-dressing is widely distributed amongst the natives of Kenya, and is found even in the heart of the Congo.

It is an extraordinary thing that two tribes living near each other, probably for many hundreds of years, like the Maasai and Kikuyu, should yet each have kept their own peculiar traditional head-dresses so distinct. It is astounding to see with what tenaciy these traditions have been held and handed down, practically without a change, for over 5,000 years. Here is indeed another proof of how little the passing of long periods of time need change or affect traditions.

Burial.

The Maasai are not supposed to believe in a life after death except for a chosen few. These happy exceptions are the medicine men and rich persons. All others are disposed of by putting the body out into the bush to be devoured by the hyena. " The body is always taken to the west of the kraal, toward the setting sun. It is laid on the left side with the head towards the north so that the face looks towards the East. The legs are drawn up to the chest, the left hand supports the head, and the right arm is folded across the breast."* As with the Masai, so also with the Kikuyu and Akamba, only elders and a few others of important standing receive burial, the rest

* A.C.H., I., 304.

are disposed of by the hyena. Those of the Akamba which are buried, are interred in the neighbourhood of the hut and the hole is only dug deep enough to prevent the hyena from unearthing the body. To quote from Lindblom:—" The minimum depth may be set at one metre. They first dig straight down and then out at the sides, so that a round hole is made. . . . . Immediately after death, and before the limbs have had time to stiffen, they are bent up towards the body, a custom which is very prevalent amongst Bantu people, and general amongst more primitive nations. The dead man is laid upon his right side, with his head resting upon his hand, as though he were sleeping. A woman is laid in the same manner but on the left side. The face is turned to the East or the West."* This contracted form of burial was used in Canaan, also in Babylon, as it was in Egypt. The idea was evidently that this position was to represent the posture of an unborn child, possibly to express that death is the birth of another life.

The Jaluo, curiously enough, bury their dead, but in such shallow graves that they are only dug up by the hyena and devoured.

The Nandi put their dead out to the hyena to the west of the hut, the woman laid on her left side, the man on his right, the hand supporting the head, but the legs outstretched. Very old men and women and very young children are, however, buried in the dung-heap of the cattle kraal. The old men are sewn up in ox or goats' hides, and milk, beer and food are put into their graves.†

The Lango bury in a similar manner to the Akamba, though deep, in order to get down to the red earth. The graves are placed for the men on the right-hand side of the door of the hut, for the females on the left.§

Mention was made above that the elders and more important persons amongst the Maasai are buried. This is done in shallow graves in which the body, wrapped in an ox-hide, is placed in a contracted position and then covered with stones. This heap of stone is continually added to by any one, in passing, throwing a stone on it. These heaps in time reach quite considerable dimensions. That this form of burial was also practised amongst the ancient Hebrews, we learn from the fact that Absalom was cast into a pit in the wood and a very great heap of stones was laid upon him. (II. Sam. xviii., 17).

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* G.L., I., 103. † A.C.H., II., 70, 72. § J.H.D., 165.

The Taveta, a people very closely allied to the Maasai, to the N.E. of Kilimanjaro, bury their dead in a sitting posture.

A curious custom exists amongst the Akamba in the case of the second or third wife, whose body is not permitted to be taken out through the gate, but through a special opening that is made for the purpose in the village fence which is afterwards closed up again. This is more particularly interesting as an exactly similar custom exists amongst the Kayans of Borneo, where the coffin containing the dead is lowered through the floor of their pile-built houses, some boards being temporarily removed for the purpose. This is done to avoid carrying the corpse down the house-ladder, the usual exit. The reason given for this procedure is that it makes it more difficult for the ghost of the deceased to find its way back into the house.*

The Hebrew custom of anointing the body for the burial exists amongst certain African tribes, amongst which are the Maasai, and the Lango.

The burial of the kings of Bunyoro is extremely interesting, and, as with so much else in the customs of this people, it is so strongly reminiscent of ancient Egypt, that the following quotation from Roscoe is worthy of note:—" When a king died, his body had to be interred in a particular part of the country which was reserved for the tombs of the kings. A large pit was dug for the grave, and over it a hut was built. The body of the king was arranged with the knees bent up towards the chin in a squatting attitude, and stitched in a cow-skin. The whole of the grave was lined first with cow-skins and then with bark-cloth, and the body was laid on a bed of bark-cloth. Two of the king's wives were selected to go with him into the other world, and they went into the grave, laid the body on the bed as though sleeping, and covered it with bark-cloths. Then they lay down, one on either side of the body, and the grave was filled with innumerable bark-cloths, some of which were spread over the body, while others were thrown in until the grave was full and they were heaped above the level of the floor. No earth was put into the grave, which was filled with bark-cloths only. In this large shrine or temple some of the widows kept watch, guarding it constantly, and a priest and medium were in attendance. People came to the tomb to visit the King as if it were his court, and they made requests of him and brought him offerings, which became the property of the widows. At times the

* H.mD., II., 35.

reigning king would send gifts of cows to his predecessor, and the priest and the medium held communion with the dead and informed the king of anything that came to their knowledge which concerned him or his country''* The bark used for making bark-cloth is that of a wild fig-tree. Here we may possibly see again the tradition of Hathor in her form of the Lady of the Sycamore (Ficus sycamorus) and also in that the corpse is thus first wrapped in the hide of the Sacred Cow, and afterwards covered and the grave filled in with cloths made from the bark of her sacred tree. A suitable burial for a divine king, for the king of Bunyoro is regarded as divine.

The Borneans also make bark-cloth, which they get from several species of trees, principally the Kumut, the ipoh, and *the wild fig.*†

Having now described the forms of burial and disposing of the dead that are more generally used in Central Africa, it remains to see how these compare with the customs practised in ancient Egypt to which those of Canaan were, in many cases, similar. It cannot be a question of making any comparison with the costly forms of burial used by the wealthier Egyptians, so it only remains to consider the more primitive forms of Egyptian burial. Perry, quoting from Elliot Smith, says:—'' In the pre-dynastic age in Egypt, the corpse was buried lying flexed upon the left side, with the head south; it was protected from contact with the soil by linen, mats or skins, or in the larger tombs by a pallisade of sticks or a wooden frame in the grave. The small graves were shallow pits of an oval or nearly round form; the larger graves were deeper rectangular pits, roofed with branches of trees. . . . . In the course of time the graves of the richer classes became more elaborate. . . . . Also the pile of earth or stones on the top of the grave was enclosed by a wall of mud-brick, thus forming the mud-brick mastaba.''§ The pile of stones is still in use with Maasai, and was also practised under certain conditions in Canaan, as was seen in the case of Absalom.

A variation of the fenced-in mastaba is practised in Africa to-day amongst the Balenga of N.W. Rhodesia, who make a round mound above the graves of their chiefs, plastering them with clay to make them smooth, and surrounding them with a fence.**

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* J.R., 199. † H.mD., I., 200. § W.J.P., 435, ** E. v. R., 422.

Petrie says:—" The attitude of the body was always contracted in pre-historic times, the knees drawn up closer than a right angle to the spine, the hand before the face or throat, ... The dynastic people brought in full-length burial, though contracted burial continued to the end of the old kingdom. . . . . In the pre-historic times the direction was almost always with the head to the South, facing West, lying on the left side. . . . . The royal connections were usually head North, face East; . . . Down to the XIIth dynasty all burials keep this direction, North and East, and so down to the XXth dynasty at Abydos."* Petrie goes on to say that:—" *Through the later ages from the XVIIIth dynasty to the Roman period, all the simple kinds of burial were practised.*"**

THE HYENA.

We will now endeavour to trace the origin of the strange custom amongst so many of these African tribes of putting out their dead to be devoured by the hyena. That this custom may have existed in ancient Egypt is not wholly improbable, and Sir Wallis Budge even suggests such a possibility when he says:—" The making of a good tomb, however simple, demanded the expenditure of money, or its equivalent, and thus it followed, as a matter of course, that only kings, chiefs, nobles, or men of high position, who could command the services of slaves, would be buried in a tomb, and that all the the poor, or common people, would go without burial."§ And again, speaking generally of Africans he says:—" Common peoples, *i.e.*, all those who did not belong to the ruling families, were not buried, but their bodies, after death, were thrown out into the ' bush ' to rot, or to be devoured by hyenas and other wild beasts."† One naturally wonders if the hyena actually existed in ancient Egypt, and if so, why one has heard nothing either of any animistic beliefs about him, or as to his unearthing and devouring the bodies of those who received but a shallow burial in the sand. Apart from this question however, it is not difficult to trace how this practice of allowing the dead to be devoured by the hyena would have arisen out of traditions that were Egyptian.

One finds amongst the religious beliefs of Egypt more than one form of animistic tradition that might have occasioned a wandering tribe to accept the hyena as the divine disposer of the dead. We have first of all the crocodile-headed deity Sebek, of whom it is said, that he opened the doors of heaven to the deceased, and led them along the by-paths and the ways of heaven, and in short, assisted the dead

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* F.P., III., 141. ** ID., 151. § W.B., II., Vol. II., 79.
† ID., Vol. I., 167.

to rise to the new life.* Then again we have Seker, " The great god who carried away the soul, who eateth hearts, and who feedeth upon offal, the guardian of the darkness."† Again, the famous monster of the Judgment hall of the dead had many traits in common with these gods. This *Amenet*, who was also called the " swallower," was represented with the head of a crocodile, half of the body and the fore-quarters of a lion, and the hind-quarters of a hippopotamus. He was present in the judgment hall of the dead ready to devour the heart if it was found too light in the balances. Petrie describes him as:—" the monster compounded of crocodile, lion, and hippopotamus, which awaits the weighing of the soul, is called the swallower, and might be supposed to destroy the person or to incarnate the soul." He is depicted as having a small head, high and deep neck and withers, low hind-quarters, and the portion of his neck and body representing a lion is spotted like a hyena. As seen in the uncertain light of dusk, the hyena would have borne a resemblance to this creature and one can understand that a wandering people who had little time to bury their dead, accepted the hyena as a combined form of the deities described above—as carrier of the soul to the land of the west, the entrance of the underworld. As has been already noted, many of the African tribes follow the ancient tradition by putting out their dead to the West of their dwelings.

The fact too of the hyena living in deep burrows in the ground or in caves would have further convinced them in these beliefs.

That the natives believe in the hyena as a medium or means of communication with the world of the dead is shown by the Nandi belief, described by Hollis:—" They are also believed to talk like human beings, and to hold communication with the spirits of the dead. Whenever several children in one family have died, the parents place a newly born babe for a few minutes in a path along which hyenas are known to walk, as it is hoped that they will intercede with the spirits of the dead and that the child's life will be spared."§ The Nandi also say when they hear the cry of the hyena in the day-time, that it is the call of the spirits of the dead.

In connection with this custom of leaving their dead to be devoured by the hyena, it must be noted that amongst certain tribes (not Semitic ones, however), it is customary, instead of giving the dead to the hyena, for the family and friends of the deceased to

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* A.E.K., 113. † ID., 114. § A.C.H., II., 7

eat the dead body themselves. A picture of this is given by Roscoe when writing about the Bageshu. He describes this ceremonial cannibalism as follows:—" As soon as darkness falls the body of the dead man is carried out and deposited upon a piece of waste ground, and sounds as of the howling of jackals rise all around. This noise is meant as a warning to all people to keep to their houses . . and the children are frightened into obedience by being told that wild animals are coming to eat the body. In reality the sounds are made by men . . . . . All the people, therefore, keep within their huts, while some old women proceed to the waste ground on which the body lies and cut it up, carrying back the parts to the house . . . . the portions they carry back have to be cooked and eaten by the mourners, who during the next four days meet together to wail for the dead and eat the flesh. The bones are burned and nothing is left to bear witness of the ceremony but the skull, which is cleaned and kept in some prominent place either in the hut or at the door . . . . ."* It should be realized that what we have now seen is not an expression of cold-blooded canibalism for the mere pleasure of eating human flesh, but a purely ceremonial custom of a sacramental character, probably handed down from a higher state of civilization, for ceremonial sacramental cannibalism existed in ancient Egypt, in conjunction with human sacrifices, down to the days of the Romans. Juvenal in his XVth Satire expresses the disgust felt by the Romans at this Egyptian custom.

Referring to the remarks as to the incarnation of the soul through being devoured by the " Swallower," this ceremonial feasting of the Bageshu on their dead, must originally have signified the re-incarnation of their dead relatives in themselves, but, as well as that, it would have had a sacramental meaning, and it is very possible that this custom was derived from ancient Egypt. The sacramental character of this feasting is best described in the word of Petrie from a chapter on " Eating devoted animals in ancient Egypt ":— ". . . . . Eating the sacred animal was the bond of union of the tribe. . . . . The whole species was kin to the tribe, and the sacramental eating was needed to maintain the kinship . . . . . "† The sacramental eating of human bodies is suggested by him as follows:—" The pyramid texts, which are the oldest body of spells and prayers, continually refer to the dismemberment of the body and the replacement of the bones after being stripped of the flesh. . . . . 'Nebhat has replaced for thee all thy members, Horus presents to thee thy

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* J.R., 260. † F.P., III., 187.

flesh . . . . . he has united thee without there being any disorder in thee.' This refers to the frequent misplacement of bones found in re-united skeletons. . . . . ' I am a Prince, the son of a Prince . . . . . whose head is restored to him after it hath been cut off.' There are many statements similar to these.

" In pre-hisoric burials these customs are repeatedly found. As the evidence has been frequently questioned, the principal examples are here quoted in brief, selecting those which cannot be due to later disturbance. The skull was kept apart from the body; in five graves it was set up on a pile of stones, once on a brick . . . ; or the skull upright, while a gold necklace was round the neck . . . A skull was found buried alone; and, again, with pendants of clay laid round it . . . . . These examples are explained by the Nigerian custom of cutting off the head of a corpse and keeping it as a family treasure in the house, where offerings are made to it, especially at family festivals. . . . . This custom of severing the body, is, therefore, pre-historic, found beneath undisturbed skins . . . , and lasted until the VIth dynasty . . . There is also a complete dissevernment of a woman of Roman age . . .

Sacramental eating: In one large grave the long bones had been split, had the ends battered off, and the cellular matter scooped out; this was not done in spite, for ornaments were buried with the skull and stone vases stood around. Yet, though there were six skulls, there were no bones in connection. That this richest grave had the bodies thus treated reminds us of the Polynesian killing of Captain Cook in order to eat the divinity that had come among them. The higher the person, the more desirable to be assimilated; . . . . "*

As we have seen in the account of the Bageshu, the head of the dead was kept in some prominent place either in the hut or at the door, and so we find that in ancient Egypt a special protection for buildings was the hanging up of the skulls of oxen, which latter practice is found to-day amongst the Maasai, who place the head of the sacrificial ox by the door of their huts.

The practice existing to-day amongst the Borneans and so similar to that of the Bageshu of hanging human heads outside their houses as protection against evil, has possibly the same origin as their but recently discarded practice of human foundation sacrifice, so typically Canaanitish, which has already been considered.

On the question of cannibalism and human sacrifice we quote the following from Perry which is of interest in this connection:— " It is significant that human sacrifice tends to die out among peoples

* F.P., III., 126.

of lower culture. This fact opens up a field of research in social phsychology, and tends to give a new idea of the meaning of civilzation and its relationship to human behaviour. In North America and Mexico the contrast is striking between the highly civilized Mexicans and the Indians of the plains, greatly their inferiors in culture, but lacking their hideous customs. These Indian tribes have rejected human sacrifice and cannibalism as foreign to their ideas and desires."* In summing up the question of human sacrifice in the chapter " The great Mother and human sacrifice," in " The Children of the Sun," Perry says further:—" The possible sequence of events is as follows: In the first instance the earliest kings were peaceful: Osiris and Tammuz certainly bear this character. These kings, it is said, were themselves sacrificed for the good of the community, probably by drowning. So long as this persisted, it is hard to see what war-like developments could take place. But a great transformation took place with the coming of solar ideas. Both in Egypt and Sumer the mother goddess, when connected with the sun-god, is destructive and martial. In Egypt she gets the human blood necessary to rejuvenate the king. That is to say, instead of the king being killed, human victims are now got, and thus the situation is entirely altered. The king, no longer doomed to die, has the power of life and death over his subjects. The education of ruling groups in war-like behavious begins from that time.

" This conclusion will doubtless appear surprising to some readers. They must remember, however, that the available evidence is dead against the ascription of regular pugnacious behaviour to early man, and that the causes of this behavior must be sought in food-producing communities. It seems certain, to me at least, that the whole study of social psychology will have to be ordered on different lines in the future if any progress is to be made. The facile habit of inventing pictures of early times will have to be abandoned in favour of the method of relying solely on facts, however unpalatable they may be."** These extracts have been given to show, in the first place, what is the view held by a modern school of thought concerning the question of human sacrifice and cannabalism existing in the world to-day, and to point out that these practices are rather signs of a former higher state of civilization than of a primitive one. In face of the evidence that has been brought forward in these pages in support of the belief that these African tribes, must, at an earlier

* W.J.P., 238. ** ID. 238, 239.

period, have been in close contact with or portion of a high civilization, even their cannabalistic customs only form further evidence pointing to this fact.

NOTE.—Since the above was completed the writer has received some further literature on ancient Western Asiatic conditions; and must therefore add that the native burial customs described above resemble those of Western Asia far more closely than those of Egypt.

CHAPTER VI.

WESTERN ASIATIC SUN AND ASHTART WORSHIP IN KENYA, ETC.

Native beliefs, customs, and objects of ethnographical interests are only included in this review in so far as we believe that they have any bearing on the question of the origin of those tribes with which we are dealing; this is by no means intended as an ethnographical survey—as such it is necessarily very incomplete.

We shall now proceed to discuss those ornaments and articles of wearing apparel belonging to African and Bornean tribes which seem to point to a common origin.

In the matter of their war-dress one finds a striking similarity between that of the Maasai and of the Bornean warriors. In both cases it consists of a garment in which a hole has been cut, through which the head is passed, and which hangs down loose and unattached back and front. Hose and McDougall describe the Bornean war-coat as follows:—" The war-coat is made of the skin of the goat, the bear, or (in the case of distinguished chiefs) of the tiger-cat. The whole of the skin one piece is used, except that the skin of the belly and of the lower parts of the fore-limbs are cut away. A hole for the warrior's head is made in the mid-dorsal line a little behind the skin of the head, which is flattened out and hangs over the chest, descending to the level of the navel; while the skin of the back, flanks, and hind limbs in one large flap, covers the back and hind parts of the warrior as far as the bend of the knees. . . . . The warrior's arms are thus left free, but unprotected. In the finest coats there is a patch of brightly coloured bead-work a the nape of the neck, and the " back flap " is adorned with rows of loosely dangling horn-bills' feathers; but these again are considered appropriate only to

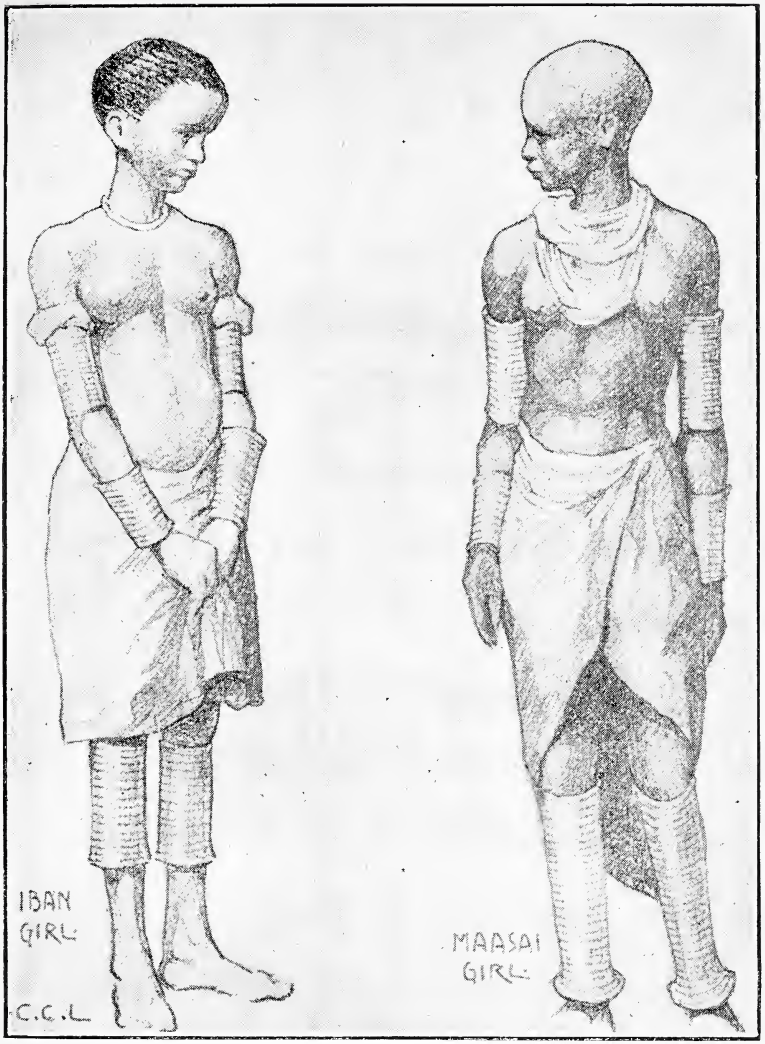

PLATE E.

Arm and leg wire ornaments of Bornean-Iban and Maasai girls.

the coats of warriors of proved valour.''* The Maasai warrior's war-coat is constructed on similar lines and the equivalent to the feathers which hang detached on the Bornean war-coat is found in the strips of leather which also hang in this fashion on the Maasai coat; the idea being the same in each case. Still more like the Maasai war-coat is the " war-coat " worn by the Iban women of Borneo at the war dance executed on the return of the warriors from a successful raid. These coats are decorated all over with shells sewn on after the fashion of spangles, and are fringed at the end with longish air. The general style is identical to that of the Maasai, which also has fringed ends not of hair but of leather. The effect of the war-coat of the Bornean warrior, when seen from the front, is that of a ruff, and the equivalent effect is achieved by the Maasai with the collar or cape of *vulture's* feathers which he wears over his shoulders. The fact of the collar being made of vultures' feathers is significant, as here again we see the tradition of the vulture soul-bird of the Egyptian deities.

Another curious custom found amongst the Maasai as well as the Borneans is that of the men wearing " sitting-mats " attached to their waist-belts. Those of the Maasai are made of hide, whereas the Bornean ones are of plaited fibre.

Other striking similarities between Bornean and African customs are found in the practice of mutilating the lobes of the ears by piercing the same and extending them by means of plugs and weights until they hang down in big loops to act as receptacles for carrying innumerable ear-rings. Hose and McDougall write on this custom as follows:—" The ear-rings are the most distinctive feature of the Kayan woman's adornment. The perforated lobes of the ears are gradually drawn down during childhood and youth, until each lobe forms a slender loop which reaches to the collar-bone, or lower. Each loop bears several massive rings of copper . . . . , whose combined weight is in some cases as much as two pounds. Most of the Kenyah women also wear similar ear-rings, but these are usually lighter and more numerous, and the lobe is not so much distended. The women of many of the Klemantan tribes wear a large wooden disc in the distended lobe of the ear, and those of other Klemantan tribes wear a smaller wooden plug with a boss . . . . ''** This might almost have been written of the tribes of Kenya Colony, and, as regards the ear-ornaments of the Kenyahs, of the Kikuyu tribe in particular, for it is their custom to wear a great number of large, light rings, made of beads strung on wire, in each ear. One also finds amongst the

* H.mD. I., 163. ** ID., 47.

Kikuyu, as well as amongst the Maasai and the Nandi, the custom of wearing plugs of wood or wooden discs in the ear-lobes, exactly as described in the case of the Borneans.

Before leaving the question of ear-ornaments it is interesting to point out another strong similarity between those of the Borneans and of the African tribes under discussion. Many of the men of the Ibans or Sea Dayaks wear a row of small rings inserted round the margin of the shell of each ear.* Exactly the same custom exists amongst several tribes of the natives of Kenya Colony, more especially amongst the Suk, the shells of whose ears are often closely studded with these small rings. Amongst the Kikuyu too, one sometimes finds the same practice, though the rings are fewer in number and of larger size.

The ornaments worn by the Maasai and Nandi women are unusually interesting, and though differing in some respects they are very similar in general syle and consist chiefly of coiled wire, sometimes of brass and sometimes of iron. The Maasai women and girls completely sheath their arms from shoulder to elbow, and from elbow to wrist, and their legs from knee to ankle, in closely wound coils of polished iron wire. The Nandi envelop both the lower and upper arm in exactly the same fashion, but on the legs they only wear about three to six inches of coiled wire below the knee. Both Nandi and Maasai married women wear ear-rings of a similar design; they are discs of closely coiled and highly polished brass wire. With the Nandi these discs are as much as six inches in diameter, with the Maasai they are smaller. In both cases these discs are attached to the very extended ear-lobes, and, in the case of the Nandi, hang down so far as to rest one on each breast. In addition the Maasai married women wear wide necklaces or collars made of coiled, polished wire, which rests on the shoulder and the upper part of the chest. As has been noted only the married women wear these ear-rings or collars, but even the young unmarried girls—scarcely more than children—wear the wire arm and leg ornaments. When one considers the weight of these massive metal ornaments—amounting in some cases to as much as seventy pounds—and the way in which the coils of wire must necessarily restrict the free play of the muscles, it is almost incredible that these women can and do undertake any manual labour, and have so fine and graceful a carriage. We hope further on to give what we believe to be the reason, other than that of vanity, why they burden themselves with these impedimenta.

The Iban girls of Borneo wear on their limbs wire ornaments almost identical to those of the Maasai girls, but in the former case

* H.mD., I., 47.

they are slightly less exaggerated in shape. In Pl. E., we see a Maasai and an Iban girl drawn side by side for the sake of comparison.

Hose and McDougall mention that a well-to-do Kayan woman wears so many ivory bracelets that both fore-arms are sometimes sheathed in them.*

A most striking and extraordinary form of " garment " is worn by the Iban woman, a description of which is best given in the words of Hose and McDougall:— . . . . and a corset consisting of many rings of rattan built up one above another to enclose the body from breast to thigh. Each rattan ring is sheathed in small rings of beaten brass. The corset is made to open partially or completely down in front, but is often worn continuously for long periods."** This custom of winding the body round and round with wire has its equivalent amongst the Kikuyu and allied tribes. The women of the Wimbe tribe, at the foot of Mount Kenya, ornament their loin-cloths or short skirts in this fashion with cords made of beads. Amongst the Iban women a *short* corset reaching over the hips as far to the waist-line is also used. The Kikuyu again at their circumcision ceremonies wind the entire bodies of the girls round and round with coils of cord composed of beads.

We cannot possibly believe that these ornaments, so peculiar, not to say unique, in character, common both to the Borneans and to the tribes of Kenya, could have been independently and spontaneously evolved by peoples who to-day in other ways differ from each other in such a remarkable degree, and who live in such widely separated parts of the world. When considered in the light of so much other evidence they seem an additional proof of the common origin of these peoples.

Now sun-worship is not, and never was, a popular form of religion amongst African peoples, not even in ancient Egypt, where it was very different in character to that of the Western Asiatic sun-worship, as practised amongst the neighbouring peoples to the north-east of Egypt. Sun-worship was introduced into Egypt in early dynastic times, and, though it became the official cult of Egypt as the result of its acceptance by the royal family and the aristocracy, it never became popular with the bulk of the people, who continued their original forms of worship of the deities of the night and of the nether world. We think that we shall be able to show that many things

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* H.mD., I., 47. ** ID., 46.

point to the fact that the sun-worship of this portion of Africa is not of Egyptian but of Canaanitish origin. The particular characteristics of Canaanitish sun-worship, which also in such a prominent manner included the worship of the moon, " The Queen of heaven," the great mother goddess Ashtart of the Canaanites, the Ashtoreth of the O.T. was the honouring of the origin of life, expressed in the debased worship of the organ of procreation as symboliized by the form and shape of the phallus. This cult tolerated all forms of immoral practices, and it would seem even encouraged them, and temple prostitution and communal prostitution flourished under its patronage. Ashtart herself under one of epithets was known as Kadesh (cf. Kedesha=' temple harlot '). The ceremonial immorality and obscene orgies that were practised in connection with this cult in and around " the groves " of the " high places " need not be dwelt on but mention of these conditions must be made for the sake of comparison with similar practices amongst the Nandi and Maasai. These, as well other Nilotic tribes practise the custom of worship under trees on hill-tops, where they perform sacrifice and religious dances and rites. Now this worship on the hill-tops, under trees, is most particularly typical of ancient Canaanitish religious practice. With regard to certain of these native festivals and dances, the licence, obscenity, and debased orgies that take place at times, particularly at the night festivals, can only be compared to those that took place around the groves in ancient Canaan. The nudity of the men of the Nilotic tribes has often been remarked on, and here again we seem to see the traditions of Canaanitish phallic worship. In the Mosaic law and elsewhere in the Biblical records the Israelites were especially forbidden to " uncover " their " nakedness "; the necessity for these injunctions can only have been due to the fact that the neighbouring Canannitish tribes were accustomed to expose the generative organs in connection with their degraded forms of religion. Although this is of course but negative evidence, we consider it worthy of inclusion and serious consideration. It should be noted that amongst the Nandi people the men will cover themselves before married women, whereas they take particular trouble not to do so before girls and unmarried women. Practically unrestricted free-love is permitted between the unmarried men and girls, amongst the Nandi, Maasai, and allied tribes.

The custom amongst the Masai of the girls living with the warriors in special kraals, is too well known to require detailed description; this existence of communal free-love would seem to be another heirloom of their Canaanitish origin. Sir James Frazer, after giving examples of this custom in other places, says that such customs support the hypothesis that amongst the ancient peoples of Western Asia also the systematic prostitution of unmarried women

may have been derived from an earlier period of sexual communism.* That such conditions existed in ancient Canaan is also evident from the special warning given in the Mosaic law against parents prostituting their daughters, Lev. XIX., 29, and again suggested in Ezek XVI. and in Mic. I.

Lindblom has recently issued a paper on " Lip-ornaments in Africa, and in particular those of stone." It would seem that these lip-ornaments are most extensively used amongst Nilotic-Hamitic tribes, a group of which perhaps the Maasai are the most representative. As far as is known to the writer lip-ornaments are not used by the Maasai to-day, but up to a fairly recent date they seem to have been worn by certain portions of the tribe. These ornaments were of stone, but when it was possible for them to obtain it they were made of a strip of glass cut from the circumference of a bottle and ground into shape by means of stones. They were long and fairly thin, and were worn by the men in the under-lip which was pierced for this purpose and may be supposed to represent the equivalent of the Egyptian divine beard. Lip-ornaments are not worn by the Nandi but are extensively used amongst neighbouring and allied tribes, such as the Kitosh, Suk, Turkana, and others; amongst the tribes who wear them they are also used by the women. Now Lindblom, having shown that these objects are preferably made out of rock-srystal or quartz, ventures to suggest that this form of ornamentation may have two meanings, and speaks on the subjects as follows:—" It would seem from the examples now given that rock-crystal and quartz are of importance for many native peoples in connection with rain-making, and certainly also with regard to the question of fertility in general. I venture therefore to suggest the possibility that, as in Africa Lip-ornaments of these stones are chiefly worn by women, they may be intended to increase their fertility? the circumstance that at least in Kitosh and the surrounding districts—how it is in other places is not stated by the authors—they are worn only by grown girls and young wives, seems to support this possibility. But I venture to go even further and to throw out the question: do they originally represent a phallus? " (Translated from the Swedish by the writer).**

Lindblom is possibly perfectly right in this latter conjecture, for, as will be shown, the general character of the religion of the tribes of this portion of Africa, is distinctly phallic and typical of the Western Asatic cult of the forces of procreation and fertility. The

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* A.A.O., II., 265. ** G.L., II., 465.

writer, however, ventures to believe that lip-ornaments originated with these peoples during their passage through Egypt and that, together with so many other insignia of divinity and royalty, they also appropriated to themselves that of the beard of the Osirian deities of ancient Egypt. Possibly they accepted the beard as a special emblem of fertility, and may have ascribed to it the " phallic " character that Lindblom suggests. We have ventured to identify *Naitero-gob* (Merker's spelling) with the Egyptian earth-god Qeb. His particular attributes as a deity of fertility are expressed by the plant-life springing from his body; may we assume, that the beard with which he is depicted is worn as symbolic of the same characteristic. If this be so, then we have the clear pedigree of the custom of wearing lip-ornaments amongst Nilotic tribes.

With regard to the use that Linblom ascribes to the lip-ornaments of quartz and rock-crystal as fertilizing agencies, these substances as well as brass and beads, cowrie shells, etc., used as ornaments have from time immemorial been worn on account of their magical life-giving and fertilizing properties, and Linblom arrives in this respect at exactly the same conclusion as that, as will now be shown, the writer holds with regard to brass and bead ornaments worn by the women of the Masai, Nandi and allied tribes.

The fact that we know that the Nandi are sun-worshippers gives us some guidance in forming an opinion as to the original symbolic meaning of all their wire ornaments, the sense of which is no doubt obscure to the wearers themselves to-day. A further suggestion is to be found in the Maasai names for serpent, and for the large ear-rings which have already been described. The Masai word for serpent is *'l-asuria*, and that for the brass discs worn as ear-ornaments *surutya*. Amongst the Nagas of India, who are sun and serpent worshippers, we find their name for sun is *Surya*, and again Kassites' sun-god was *Suriash*. This information is taken from C. F. Oldham's " The Sun and the Serpent," and he further mentions a deity of a similar name, *Suriha*, mentioned in Assyrian inscriptions, who was a sun-god and identified with Aa or Ea the sun-god of Babylon. We believe all these words to have come from the same root as the Hebrew noun *saraph*, meaning " burning one," also " a burning, fiery, or stinging serpent " and the verb *saraph* " to burn," also, " to be elated." It is worthy of note, in this connection, that the Hebrew for breast-plate or coat of mail, is *shiryan*, which would seem to be from the same root, no doubt in connection with shining metal. That amongst the Nandi brass wire ornaments are symbolic of the sun may possibly be inferred from the following riddle told by Hollis:—" What is the sun rising out of the valley like? Reply: Brass wire."* Now

* A.C.H., II., 136.

the large brass wire discs worn as ear-ornaments by the Nandi women, one on each breast, seem to us to represent the coils of the serpent (coiled brass wire) forming the shining disc of the sun, and it must be remembered that in Western Asia both the serpent and the sun were regarded as bestowing fertility on women, which is in all probability the original reason why these ornaments are used amongst the Nandi and Maasai.

An indication that the Maasai have been sun-worshippers in the past is also to be found in the fact that they still on occasions direct their prayers to the sun, but it is still more significant that they should in certain cases look on the snake as sacred, even believing that their medicine-men and rich persons are re-incarnated in that form; the skin-coats, too, which are worn by their elders are supposed to resemble a cobra's hood.

The close connection between brass and the serpent amongst the ancient Semites can further be gathered from the fact that another term in Hebrew for serpent was *nachash*, the allied Chaldean word meaning brass, copper, being from an " assumed root " meaning " to be bright," and the Hebrew for brass, copper, is *nachush*, *nechash*, from the same root as *nagah* = to shine. That the serpent was closely connected with the sun-worship of ancient Caanan is too well known to need any emphasis here, and ornaments figuring serpents were also worn by the people, as evinced by the fact that bronze figures of serpents, and serpents heads as amulets, have been found both at Gezer and at Taanach, and we believe that we are perfectly right, on the evidence now given in connecting the use of the wire ornaments of the Maasai and the Nandi with ancient Western Asiatic sun and serpent-worship.

Only a slight reference is necessary to the other wire ornaments of the people. The coils of polished wire with which they sheathe the greater part of the legs and arms were no doubt originally intended to represent the coils of the sacred serpent, and were worn for the magical life-giving and fertilizing properties which they were supposed to possess. This would apply equally well to the Iban women of Borneo with their coiled wire ornaments and corsets, which also point to an advanced form of sun-worship at an earlier period of their history. Though the original meaning is probably forgotten by them to-day, yet possibly these ornaments are still credited with the power of bestowing fertility. We must remember that in ancient times certain natural substances were regarded as possessing magical, " life-giving " and " fertilizing " qualities, and of these gold and pearls were the most important; and as, amongst the baser metals brass was the substitute for gold, so beads were the substitutes for the more costly pearls, and just as we see the use of brass, rock

crystal and quartz, so we find beads also used extensively among these tribes as also cowrie-shells. We have remarked on the way the Kikuyu wind ropes of bead-work round the bodies of the female circumcision candidates. Now circumcision amongst these people takes place at puberty, or in other words, when the girls have arrived at an age when they are eligible for marriage. It is reasonable, therefore, to suppose that these bead corsets are or were primarily intended to give them fertility that they might bear children in plenty to their future husbands, and we claim the same origin for the custom of the Iban women of sheathing their bodies with wire corsets.

Lindblom has remarked that:—" Religious ideas and rites being most tenacious of existence, are always certainly met with even among a people whose physical life and circumstances have been entirely changed,"* which statement is made in connection with his opinion that the Elgoni and Nandi were originally one tribe, who, though their natural conditions have become unlike, have still retained their joint language and religion. We venture to apply this statement of a very sound authority of express what we believe in the present case as to the tenacity of ancient religious tradition; for we think that native ornamentation presents to us, with all its complicated and inviolabe rules applicable to different ages, sexes, and conditions, the remnant of a highly organised religious system where ornament and decoration were the consciously evolved symbols of occult meaning.

Another indication of the Canaanitish origin of the sun-worship of these people may be seen in the short account given in a recent issue of this Journal by C. E. Ward on the sun-worship amongst the Lumbwa who are a branch of the Nandi group. The points that chiefly interest us in this connection are that what is evidently the substitute for an altar is built out of cow-dung by some little girls—a circular wall five inches high and three feet in diameter. Into this is poured by two officiating elders beer, milk and water, *i.e.*, the offering. At a little distance from this " altar " are placed two poles about four foot apart near which a fire has been lighted. The participators in the festival enter and place themselves around the " altar " and the officiating elders sprinkle them by means of a cow's tail from the contents that have been poured into the " altar." We seem here to have the picture of an ancient Canaanitish ceremony performed at a " grove," and in the poles we seem to see the " asherim," or sacred poles, so indispensable a feature of the Canaanitish worship of the deities of fertilization. The asherim were sacred poles which stood near the altar, and which appear by some to have been regarded as

* G.L., III., 49.

embodiments of Ashtart; again by other authorities they are viewed as phallic emblems.

Recent excavations in Palestine have laid bare remains which give us a picture of the ancient " High Places " of Canaan, where the worship of the asherim took place, and where the worship was often of the most licentious and obscene character. The " High Place " at Gezer shows a row of stone pillars or obelisks (masseboth), one of which was found polished and smoothed by annointing with blood and oil. Between two of them was set a large socketed stone, beautifully squared, which is thought to be a sacred laver. The character of the worship of this shrine is well seen from the fact that in the soil that had accumulated over the site were found numbers of male emblems, rudely carved in soft lime-stone, and also terra-cotta tablets representing in relief the mother goddess. These were no doubt votive offerings to the deities of the place, which were believed to be embodied in the sacred poles and stone pillars; these deities were regarded above all as sources of fertility. An idea of the form of sacrifice that was at times practised here may be gathered from the fact that under the floor of this shrine was found a cemetery of jar-buried infants, who had, evidently in accordance with the prevailing custom of the dedication of the first-born, been sacrificed to the deities of this " High Place." In connection with what we have said previously concerning the serpent-like character of native ornamentation, it is of extreme interest to note that in an enclosure close to the pillars at Gezer was found a bronze model of a cobra. May one not suppose that this was set up in the shrine as a magic symbol of fertility for those to look upon who wished to become mothers. Ashtart herself was often represented as holding a serpent in her hand.

Now in the " High Place " at Gezer we seem to see the origin of the Lumbwa ceremonial given just above, and identify the cow-dung " altar " of the Lumbwa with the stone laver. The wooden pole or poles of the shrine at Gezer would have perished with time, but no-one can doubt that they were originally there. As we see the officiating elders of the Lumbwa doing to-day, sprinkling the worshippers from the contents of the cow-dung " laver," in like manner we can be pretty sure that the worshippers of that ancient shrine were also sprinkled with the contents of that stone laver, and not they only, but also the stone pillar or post that, as was seen, was smeared with oil and blood.

We have noted earlier the existence in Africa of the two Canaanitish deities Molech and Chemosh, now degraded to the status of evil spirits—Chemosh being the same, as we believe, as the Chemos of the Nandi, as also of the Lumbwa, with whom we are now dealing;

the character of this spirit has already been noted. The Nandi-Lumbwa do not sacrifice their children to the deity to-day, even though he is the sun and their god of fertility, just as were the sun-gods of old in ancient Canaan. This special aspect of the god of fertility is clearly realized by the fact that the prayer to the sun on the occasion that we are now considering, is:—" I am now giving you milk—do you give us children—cattle, wimbi and good grazing." It was to the deities of fertility that human sacrifice of the first-born was practised in ancient Canaan. That children figure particularly in the festival described by Ward, would seem to us to be a tradition retained of the conspicuous role they once filled, and that whereas formerly they constituted the offering laid on the altar, the share that has later been allotted to them has become that of merely preparing the altar, on which previously they used to be sacrificed.

In the account given by Ward of the Lumbwa ceremony it was mentioned that a fire was made near the poles, but it is not stated why this was lighted and kept burning, nor what kind of wood was used for the purpose. Several varieties of trees are sacred to the Nandi-Lumbwa people, and it is practically certain that some special wood was used for the fire in question. In the tenth commandment of the Maasai a sacred fire was commanded to be made from a special kind of wood once a year, and this wood was of a sweet scented kind—in other words this fire was an incense offering, so the writer takes for granted that the fire of the Lumbwa at their poles is lit as an incense offering to the deity with which these poles are or originally were identified. That incense was burned at the ceremonies that took place at the shrine in ancient Gezer, is evident from the fact that at the excavations was unearthed a jar containing a powder, which was found to be incense.

The licentious character of the worship at the " High Places " in Canaan has been noted, and sexual orgies were part of the ceremonies of worship that took place round the asherah or " groves." We have already suggested in this chapter the similarity in this respect with the Nandi worship. A closer insight into the character of such ceremonies as they are practised amongst the Batwa of Lake Bangweolo in N.E. Rhodesia is given in " Man," May, 1914, by Dugal Cambell, to which we refer those who are interested in more detailed particulars. The Batwa belong to a large group whose good and evil deities are the Leza and Molechi for whom we have already suggested Canaanitish origin. Leza, it must be noted, holds the position of supreme deity, who is so remote that he does not take any active interest in their affairs. The deity to whom the above ceremonies refer is another, and that he, or she, is pre-eminently a deity of fertility is shown by the following from Cambell's paper:— " Songa— a powerful local deity—who, they said, was very angry

because Batwa ceremonies and his worship had fallen into neglect. He ordered them to be revived at once, and that all Batwa who had wished a successful harvest must send to him to have their seed blessed." In these last words is, it would seem, summed up the entire principle of the very widespread cult of the fertilizing deities of Western Asia.

Having suggested the possibility of the Chemos, of the Nandi, having been originally the Chemosh of Moab, and having also noted the phallic character of the worship of the Nandi, it is interesting to give the following extract from an Ancient History of the eighteenth century, which we shall have reason to refer to again later:—" The idols of the Moabites taken notice of in Scripture are Chemosh and Baal-Peor, sometimes simply Peor; or as the Septuagint writes the name Phegor. But what gods these were learned men do not agree. St. Jerome supposes that they were both names of one and the same idol (Hieronym. in Esai. 1.5.): and from the debaucheries into which those fell who defiled themselves with their worship, several writers both ancient and modern, have represented them as obscene deities, not much different from Priapus (Idem in Oseam, and contr. Jovin - l. 1. c. 12. Origen in Numer. Homil. 20 Theophylact. in Hoseam. Cumberland on Sanchon, p. 67, etc.)." A foot-note tells that " they offered him dung; which the Jews pretend was the worship proper to this idol (Solom. Yarhi Philon. Jud. de nomin. mutatione, p. 1061.)" The character of the worship here given is certainly most descriptive of that of the Nandi-peoples, even down to the sacred uses to which dung was applied. We have already seen the sacred use to which it was consecrated in the making of the altar or laver in the description given of the Lumbwa ceremonies. Its sanctity is further seen in the custom amongst these people when they bury their dead of doing so in the dung of their cattle-kraals. As grass has its sacred uses amongst them, so also has human dung, and Hollis relates that " A Nandi will not slay a foe if he sees that a man has grass in his hand or if the enemy can throw some of his own excrement at him."* The following custom practised by the Nandi is particularly interesting as it was evidently one that existed in ancient Canaan amongst the neighbours of the Israelites:—" When a Nandi child is four months old, its face is washed in the undigested food found in the stomach of an animal sacrificed in the honour of the occasion."† And again, having described a number of forms of ceremonial uncleanness amongst these people Hollis relates that:—" the mode of lustration

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* A.C.H., II., 74. † ID., xxi.

employed in these cases is to kill a goat and to rub some of the offal on the person's face and legs."** The same form of lustration is also practised amongst the Kikuyu and the Akamba. The equivalent practice as existing in ancient Canaan, and possibly referring particularly to its existence amongst the Moabites, is expressed in Mal. II. 3.:—"-I will corrupt your seed and spread dung upon your faces, even the dung of your solemn feasts." The solemn feast took place with the eating of the sacrificial animal.

The sanctity of trees amongst the Nandi has been mentioned above, and this brings us to another custom that would seem to be of Canaanitish origin. Trees, for these people, constitute their "cities of refuge." "These and rivers are regarded as sanctuaries, and no Nandi may kill a man who has taken refuge in one of these."* Sacred trees are regarded in the same way as sanctuaries by the Kikuyu.† Cities of refuge were a typically Canaanitish institution which the Israelites adopted on taking possession of their land. The Cananitish cities of refuge were "Holy cities"—the seats of high deities, and as deities and trees, were identical in so many instances, one can see how trees would have become sanctuaries for refuge to a wandering tribe, in place of the fixed cities of refuge.

Probably another relic of ancient Canaan is the custom found amongst these people, and other tribes that have been discussed, *i.e.*, that of the male and female circumcision candidates wearing the dress of the other sex. That the extensive ceremonials which include circumcision were not originally merely the initiation into tribal life and its secrets, is evident from many indications; there can be no doubt that it was originally the initiation into the higher life of the deity, and as we hope presently to show this was also the case with these tribes. The origin of the customs now referred to of the candidates adopting the clothing of the other sex, was in all probability in honour of the deity to whose service they were being dedicated, and we find the equivalent in ancient Canaan in the worship of Ashtart—the mother goddess of Western Asia, who in one of her aspects was believed to have been of dual sex—where priests officiated in the garb of priestesses, and the priestesses in the garments of priests. It was no doubt in protest against this practice and what abuses it may have licensed that the Mosaic law stipulated that "the woman shall not wear that which pertaineth unto a man, neither shall a

** A.C.H., II., 91. * ID., 74. † C.W.H., 47.

man put on a woman's garment: for all that do so are abomination unto the Lord thy God." Deut. XXII. 5.

Yet another custom amongst the Nandi which may have originated from the same source and for the same reason, *i.e.*, that of symbolizing the deity is that of the girl circumcision candidates veiling themselves for a period after the ceremony has been completed. This custom was very possibly originally observed in the rites of initiation into the worship of the Canaanitish Ashtart, after the example that, perhaps, she may have set them, as she also figured as the veiled goddess, for in one of her types, discovered at Gezer, as also at Teil Halath she was represented wearing a veil.* Dare we venture to suppose that the great mother goddess in this aspect had undergone the rite of circumcision herself; that she voluntarily afflicted herself in this manner as a form of penance or in sympathy with the self-afflicted mutilation of the one who she loved and desired so passionately, and that this aspect of her was originated to facilitate the introduction of female circumcision amongst the people who were her votaries, as the need for female circumcision had become necessary in order that the women who, from a very early age, had become accustomed to free and unrestricted licence, would, as married, remain more faithful to their husbands.

Circumcision, both male and female, is practised amongst the Maasai Nandi and allied tribes, and also amongst the Kikuyu and others. We do not intend to go into the details of the extensive ceremonials that take place in connection wih this ceremony; our purpose now is to show what significance this rite has for the people to-day, and to see what deeper import it may have had for them earlier in their history.

The antiquity of both male and female circumcision is too well established to require any emphasis. It was practised in ancient Egypt as well as amongst the peoples of Western Asia. Under the Mosaic law the Jews only circumcised their males. The significance of this rite was the outward and visible sign that they were dedicated to their god and were accepted as his chosen people. We venture to believe that the act of circumcision had the same meaning amongst the other peoples of antiquity, and that female circumcision, in particular, stood in close connection with the worship of the mother goddess, and that by this rite of circumcision, performed as an act of a sacrificial character, they dedicated themselves to and became accepted by her as her especial and chosen people. We also believe that circumcision was practised as a rite of purely religious character

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* E.R.&E., " Canaanites."

though in all probability it was instituted for practical reasons. That in its action circumcision also automatically included acceptation into tribal and national life, was the inevitable result of the close relationship that existed between the tribe and its deity—each and every individual of the tribe being dedicated to the deity. The tribe as a single unit belonged in its entirety to the deity and thus participation in tribal life was one and the same thing as participation in the life of the deity.

Circumcision amongst native tribes to-day is generally regarded merely as the initiation into tribal life, and in most cases this is no doubt the only significance that the natives themselves attach to it, but we hope to show in the following pages that it has not always been restricted to this particular meaning. We believe that the original, sacramental meaning of this rite, has gradually faded from the individual mind in exact proportion to the mental degeneration of the tribe, so that now that they have sunk to a state of " savagery," circumcision means no more to them than a participation in the privileges and rites of tribal life. In face, however, of the indications that we shall now bring forward as evidence of the fact that circumcision must at an earlier date have symbolised both by its sacrificial and sacramental character the initiation of the candidate into the life of the deity, the writer ventures to suggest that, though in the main, circumcision is merely regarded as the entry into tribal life yet at the back of the native mind there may still linger a vague sense of a religious meaning. Whether this is so or not one thing at least is certain; circumcision, *i.e.*, the extensive ritual of which the act of circumcision is but the central point, is the most important event in their lives, and one to which they attach the highest significance. It does mean life to them, even if no more than tribal life, for without it they are dead to the inner life of the tribe.

The most complete records of the life and customs of a Kenya tribe that the writer has yet met with is Lindblom's " The Akamba " and we strongly recommend this to those who want a graphic and detailed description of the life of a native in all its phases. To this work we are indebted for a very valuable description of circumcision. But first, and for purposes of comparison, we wish to give again even at the risk of repetition, the picture from antiquity of the act of initiation into the life of the deity. We have shown Hathor in the character of a cow and of her adoption of the Pharaoh by means of his initiation into her divine life by sucking the milk of life from her udder. Hathor in her other character, that of " the Lady of the Sycamore tree," was, as we have seen, represented as dwelling in one of the wild sycamore or fig-trees (ficus sycamorus) on the borders of the Libyan desert in the west. Here she awaited the souls of the

departed to welcome and accept them into her realm. From the fig-tree she stretched out her divine form to greet the soul on its arrival, offering it on a tray a vase of water and some cakes; this sacrament having been partaken of, the soul was accepted into her realm. In her aspect of the cow, Hathor gave her milk—the milk of life; in that of the fig-tree she gave as its equivalent the water and the bread. We will now turn to Lindblom's description of the Akamba circumcision ceremonies with its striking resemblances and parallels. (The Akamba were formerly close neighbours to the Maasai, and inhabit to-day the country S.E. of the Kikuyu).

Lindblom tells us how, early in the morning, the initiators of the circumcision candidates (evidently the relics of a former priesthood) go in search of a wild *fig-tree* which must be in an easterly direction. Having found which they each in turn, beginning with the eldest, spit on the tree and pray:—" Fig-tree, we have come to pray you to give us milk-juice for the asiggi." (The asiggi are the circumcision candidates). They make an *offering* of a little food and milk by the tree, and *smear* (anoint) a little fat on its trunk, on the right side for the boys, and on the left side for the girls. The juice (white and looking like milk) is obtained by pricking the tree with a nail, after it has been smeared (anointed) with fat in *seven* places each of the initiators catches a little in small calabashes. At nightfall they go and fetch the circumcision candidates and bring them to the tree, where they take a little milk-juice on one finger and give it to the candidates who pretend to eat it.* This *milk-juice* from the sacred tree, reminds one strongly of the milk of life from the divine Hathor in her aspect of the cow. Now it should be noted, that the real circumcision has already taken place some years previously to this which is the second and more important circumcision. The first would seem to be a more purely formal act, corresponding to our infant baptism, and the latter is evidently the ratification of the first, when, accepting all the privileges of tribal life, the candidate confirms the previous rite. That this is so is evident from what Lindblom says of annother ceremony that takes places at the fig-tree, which he also connects with the real circumcision. " A slight cut is made at the base of the glans, and a little beer is poured into the wound."** Here then we see by a symbolic act the ratification of the previously performed act which takes place before the sacred fig-tree or whatever divinity they may vaguely consider as residing within its embrace. This act has an unmistakably sacrificial character in that

* G.L., I., 56. ** ID., 57.

blood, and a portion of the body, is thus offered in symbolic substitution for the entire individual, body and soul, which is thus dedicated to the deity, and the sign of their acceptance at her hands is shown above in the gift of the milk of life which is sacramentally partaken of.

It seems difficult to reconcile the ceremonies now described, and which form such a striking parallel to the rites of antiquity of the inner meaning of which the votaries were perfectly conscious, with the mentality of these natives to-day, whose spiritual conceptions are so vague that they do not appear, as far as we know, to attach any deeper religious significance to the ceremony than that of initiation into tribal life, and we believe that we have here a survival from another and higher state of civilization from which these natives have degenerated.

To give a detailed account of the customs, ceremonial laws and animistic and religious beliefs of the native tribes of Kenya, does not lie within the scope of these pages. Undoubtedly a systematic summary of them would be of great interest and value, and would enable us to grasp more easily the extraordinary completeness and the comprehensive nature of the organization of the system known as tribal law and custom—the remarkable way these affect and control every action and even the very speech of the individual.

These tribal organizations, " primitive " as they may at first appear, have, however, in the detailed completeness of their whole system, including totemism and exogamy, an exact counterpart in the religious and civil organizations of the ancient civilizatons of Western Asia; but, whereas, in the latter case, the inner meaning of the symbolism and ceremonial was consciously and intelligently evolved, often æsthetically beautiful, and connected with artistic achievements of a high order; in the case of the native tribes of to-day, the system is merely automatic and is practically void in most of its phases of any spiritual significance, and totally devoid of æsthetic beauty. Yet, little as the native is conscious of any deeper symbolic meanings in the details of his tribal institutions, they are still the chief and vital factors of his existence; the bonds which hold together his family and social life, and the only object for his vague spiritual aspirations. It seems incredible, when reviewing the mental and material condition of native tribes to-day, that they should ever have evolved the elaborate ritual of tribal law, with all its multitudinous restrictions and obligations, and that, too, at a far earlier period, when, according to the evolutionary theory, they must have been at a lower and more " primitive " state of development than at present. For if common experience of the native of to-day proves any thing, it is this, that even when most intelligent and mentally

well-developed, he is markedly deficient in precisely those powers of systematic arrangement and organization necessary for the formation of their elaborate tribal institutions. We refer to the native here in his more or less untouched state. What possibilities may lie dormant, to be brought out and developed as the result of education and contact with our civilization, is another matter.

We have compared the Nandi and the Moabites in so many particulars, and have ventured to identify the Nandi devil, Chemos, with the famous Chemosh of the Moabites, that we will go even further, and suggest that in the earlier Nandi name for their country and their people, we may find a tradition that indicates even more definitely that they are the ancient Moabites. They used to call themselves *Chemwal* and their country *Chemngal*. The latter name name is composed of two parts—*Chem* and *ngal*, and *ngal* in language to-day means news, information; *chem* is the form of Nandi prefix used before *ng* signifying something of a small, weak, or feminine nature. We can hardly imagine that this would merely have meant " news," but *chem* might also stand for *ch'-em*=tribe, but even so it seems improbable that Chemngal should merely have meant " news of the tribe." There are, however, in the Nandi language a sufficient number of words of Hebrew origin, to justify the supposition that *ngal* may be derived from the Hebrew *galah*, which, besides the meaning, publish, reveal, tell—equivalent to that of the Nandi *news, information*, has a second meaning, *captivity, exile*. We are told in Jer. XLVIII. 7. that " Chemosh shall go forth into captivity " and from this, perhaps, is derived the original meaning of the Nandi name Chemngal—the former portion, *Chem*, being the abbreviation of *Chemosh*, the whole, therefore, would have meant " exile of Chemosh " or, " (the country of) exile of Chemosh." Thus, *Chem* in *Chemngal* would be used as in the Canaanitish place-name, *Micmash*=place of Chemosh, abbreviated, as *mash* suffixed is the abbreviation for Chemosh. *Jahweh* used in compound names thus became suffixed, Isai*ah*, *and* prefixed, *Ja*azer.

In *Chemwal*, *i.e.*, Nandi people, we seem to find the Hebrew word *valad*=children, and on this supposition Chemwal would have meant " the children of Chemosh," which is exactly how the Moabites styled themselves in ancient days, king Mesha on the famous Moabite stone, called himself " the son of Chemosh."

Nandi tradition relates that circumcision was first practised amongst them by one *Kipkenyo*, who came from a country called Do.* On the assumption that *Kenya* is a paraphrase for Canaan, then this

* A.C.H., II., 99.

Kipkenyo would mean a " Canaanite," and this old story, divested of certain legendary colouring, would point to the fact that the Nandi or Chemwal originally learnt circumcision from the Canaanites in the land of their origin. Curiously enough words of the same root as kenya refer amongst the Maasai to the future but amongst the Nandi to the past. Thus, with the Maasai *akenya*=presently, in the indefinite future; and in Nandi *kinye*, *keny*=formerly. The past to the one and the future to the other is Canaan.

Sir Charles Eliot speaking of the Maasai and the Nandi in the introduction to Hollis' " The Nandi," says:—" all information about the physical character, language, customs and religions of either sheds a light on the origin and affinities of both, and the whole group to which they belong."* This is most undoubtedly the case. The Maasai and Nandi are racially very closely allied, but for many reasons, which we have not space to deal with here, we do not believe the Nandi to be Israelites like the Maasai. Of the other Semitic tribes of ancient Canaan, there are not many to choose from, and many indications point strongly to the possibility that they may be Moabites.

Chapter VII.

ORIGIN OF NOMENCLATURE IN BORNEAN RELIGIOUS CONCEPTIONS.

In a former chapter Laki Tenganan, the supreme deity of the Borneans, and also Kalubi Angai, have been reviewed, and we have seen how these names, as well as tribal names, point to a Canaanitish origin. Amongst other religious beliefs of the Borneans we find further the mention of *Bali Flaki*, by which name they call the hawk, whose flight they study for omens to guide them when going on raids, etc. The exact wording of the phrase in the O.T. which recalls the fact that the Edomites had deified their ancestry is as follows:—" Though thou exaltest thyself as the eagle, and though thou set thy nest amongst the stars," and this reference to the eagle may indicate that in ancient times they looked to that bird—*Bali Flaki*—for guidance in their various undertakings. The hawk, it must be remembered, was the symbol of the departed soul, and in the hawk or eagle they may, perhaps, have seen the soul of their hero ancestor,

* A.C.H., II., xiii.

the god Esau. That, in the minds of the Borneans, *Bali Flaki* is anthropomorphic may be seen by the fact that, with the Kenya, he holds a peculiar position amongst the omen birds, in that an altar-post, rudely carved to represent the *human figure*, is assigned to him before their houses. This figure is in some cases surmounted by a wooden image of the hawk.* This is strongly reminiscent of the way in which, in ancient Egypt, the Ka or soul, as represented by a hawk is depicted resting above or on the head of the deity, king, or other individual. *Bali* is pure Hebrew, being the same as the Semitic *Baal*, the form of *Baali* means " my lord," and *Bali Flaki* would therefore mean " My lord of the Stars," or possibly " My lord of the heavens." With regard to the word *Laki* and its equivalent in the Maasai *L'akir*=stars, we find in Hebrew the word. *bahir*=bright. and *bachir*=elect or chosen. The coming Messiah of the Jews was referred to as "the chosen of Israel" and also as " the star out of Jacob "; in their later records he was also termed " the bright and morning star." It is possible that the Bornean *Laki* and Maasai *L'akir* may be derived from the same root as the Hebrew *bahir* or *bachir*.

Amongst the Kayans there exist two words, one referring to the soul and the other to their belief in the life hereafter. These terms are *blua* and *urip*, which words may again be traced to Hebrew origin. " The Kayans vaguely distinguish two souls—on the one hand the ghost-soul or shade, which in dreams wanders afar, on the other hand the vital principle. It would seem that so long as this vital spark remains in the body, the ghost-soul may return to it; but that, when death is complete, this vital spark also departs, and then the ghost-soul will return no more. . . . . In common speech *urip* means alive, but it is applied also as a prefix to the names of those recently deceased, and seems to mark the speakers sense of the continuance of a personality as that which has life in spite of the death of the body. Thus Blua and Urip seem to mark a distinction which in Europe in different ages has been marked by the words soul and spirit," and Hose and McDougall add, " and which was familiar also to the Hebrews."** Now *urip* meaning alive, seems to have its equivalent in the Hebrew word *ur*= light, *urim*=lights, the spark of life, the light that lingers on, as the Borneans believe, even after death. And in *blua* we may see the Hebrew *lua* meaning swallowed up—the departed soul or spirit of the Bornean that is swallowed up in eternity, beyond this present life. Again we find

* H.mD., II., 15. ** ID., 34.

Bali Urip, the god of life, which when interpreted through the Hebrew would mean " my lord light "; possibly a lingering tradition of ancient Canaanitish sun-worship.

As seen from the prophet Obadiah, it was early a practice amongst the Edomites to " set their nest amongst the stars " *i.e.*, to deify their ancestors; that this was an ancient custom amongst the Borneans, and also that they still adhere to it to-day, will be shown in the following. The Borneans themselves are fairly clear as to the fact that their deities, of which a very considerable pantheon exists, are mostly ancestors, and they claim descent from them, Hose and McDougall relate the following:—" We have little information bearing upon the origin and history of these Kayan gods. But a few remarks may be ventured. The names of many of the minor deities are proper personal names in common use among the Kayans or allied tribes; . . . . and the title Laki, by which several of them are addressed, is the title of respect given to old men who are grandfathers. These facts suggest that these minor gods may be deified ancestors or great chiefs, and this suggestion is supported by the following facts:—

' First, a recently deceased chief of exceptional capacity and influence becomes not infrequently the object of a certain cult amongst the Klemantans and Sea Dayaks. Men will go to sleep beside his gave or tomb, hoping for good dreams and invoking the aid of the dead chief in acquiring health, or wealth, or whatever a man most desires. Sea Dayaks sometimes fix a tube of bamboo leading from just above the eyes of the corpse to the surface of the ground; they will address the dead man with their lips to the orifice of the tube, and will drop into it food and drink and silver coins. A hero who is made the object of such a cult is usually buried in an isolated spot on the crest of a hill; and such a grave is known as *rarong*.

' Secondly, all Kayans, men and women alike, invoke in their prayers the aid of Oding Lahang and his intercession with Laki Tenangan. That they regard the former as having lived as a great chief is clearly proved by the following facts: firstly, many Kayans of the upper class claim to be his lineal descendants; secondly, a well-known myth, of which several variants are current, describes his miraculous advent to the world; thirdly, he is regarded by Kayans, Kenyahs, and many Klemantans as the founder of their race.

' The Kenyahs also invoke in their prayers several spirits who seem, like Odin Lahang, to be regarded as deceased members of their tribe; . . . . From all these descent is claimed by various Kenyah and Klemantan sub-tribes; and that they are regarded as standing higher in the spiritual hierarchy than recently deceased chiefs, is shown by the prefix Bali, commonly given to their names, whereas this title or

designation is not given to recently deceased chiefs; to their names the word Urip is prefixed by both Kayans and Kenyahs.''*

Odin Lahang, who has just been mentioned, is probably the same as *Edom*, as already explained under the Maasai tradition of the *Dinet*, and represents another and more personal aspect of Esau than that that has been suggested for him as Laki Tenganan. *Lahang* we venture to interpret as *Laban*, who was Esau's uncle, which may have been added in connection with the ancient matrilineal system in which the maternal uncle was so conspicuous a feature, or may only stand for the Hebrew meaning of *Laban*=glorious, and thus Odin Lahang might mean " Edom the glorious.'' Laban seems to figure frequently in personal names amongst the tribes to-day, where one finds *Aban*, *Palaban*, and *Labong*.

Amongst the names of their gods and demi-gods we also find the following, who are all, it would appear from their traditions, ancestors. For purposes of comparison we have have placed opposite these Bornean names their equivalents from the genealogies in Gen. XXXVI. Laki *Ju* Urip=*Jeush*, *Bali* Pen*yalong*=Jalam, *Ajai*=*Ajah*, *Sibau*=Zibeon What is of extreme interest in this connection is that it is known that *Jeush*, *Jalam*, *Ajah* (*Ayyah*) and *Zibeon* were also deities in ancient Edom, as was also *Caleb*.** We find, also, the war-god of the Sea Dayaks, *Singalang Burong* whom we identify with *Shingala* who was worshipped in ancient Edom.† In the Punan group is found a tribe called *Sigalang* which one is fairly safe in assuming has derived its origin from the same source as the Sea Dayak deity, and one may therefore suppose that *Shingala* of the Edomites, like so many other of their deities, was an ancestor who became deified and also gave his name to a tribe. May we venture to translate by means of the Hebrew the name of the Bornean deity *Urai Uka* as follows. *Ur-ai*=" light of Ai,'' *Uka*=heb. *yakol*=" prevail '' *i.e.*, " Light of Ai prevails.'' The Bornean *Jok*, as will be shown, would seem to be identical with the *Jaakan* of the genealogies in Gen. XXXVI. and Deut. X 6. who, it appears, was also an Edomite deity. In the beliefs of the Malanuas of Borneo is found a spirit named *Adum* Girang.§ This is interesting as *Adum* is so similar to the name Edom itself.

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* H.mD., II., 10, 11. ** E.R.&E., " Edomites.'' † ID.
§ H.mD., II, 130.

On page 43, vol. II. of " The Pagan Tribes of Borneo," is given a rough map of " the land of the shades." We find here some very interesting mythological designations. There is *Long Bali Matei*=the river of the dead; *Matei* is we believe from the Hebrew *muth*=death—Long Bali Matei would thus mean " the river of my lord death." Further *Bawang Daha*=lake of blood; *'wang* in bawang may be derived from the Hebrew *yam*=lake, sea, and *daha* from the Hebrew *dam*=blood. Then there is *Alo Malo*, which, if derived from the Hebrew *alaz*=rejoice and *malon*=lodging-place, abode, would have meant " abode of rejoicing." *Bali Akan*=" my lord Akan "=*Akan* (Gen. XXXVI. 27.) the same as the deified *Jaakan* mentioned above. *Bali Dayong*=" my lord the Judge " (see below). *Long Malan*, *malan* possibly=Hebrew *malat*=deliver, *i.e.*, the river of the delivered," *Tà padan tanah Kanan*, *padan* is the Hebrew for *plain*, *tanah* is the Hebrew for *affliction*, so the whole would have meant " the plain of affliction, Canaan." On this little map occurs also *Penyalong*, the Supreme Being, whom, above, we have identified with the Edomite deity *Jalam*, and his wife *Oko Perbungan*. *Oko*, we venture to believe, is the same as *Odoh*=*Adah*, and Perbungan we think is possibly a dialectal variation of *Tenangan*. In an earlier chapter we have used the term *Laki Tenganan* as found in Perry's " The Children of the Sun," but Hose and McDougall call it *Tenangan*, which, sub-divided, would be *Tenangan*=" of Canaan," *ang* in *angan* being the same article as in *ang-ai*; this *ang* or *'ng* equivalent to the Hebrew *k in* Canaan. *Angan* is thus only a more abbreviated form of Canaan than in *Sarangani* or the Maasai *tungani* and *Mengana*.

It is worthy of notice that as the pig was peculiarly the sacrificial animal of the original Canaanites, so is this animal amongst the Borneans to-day; and just as amongst the Western Asiatics it was the custom to sprinkle the blood of the sacrificial victim on the " altar-posts " and on the worshippers, so do the Borneans still. Again, the Canaanitish custom of human foundation sacrifice—as found at the excavations at Gezer and elsewhere—was practised until quite recently by the Borneans; now, however, they substitute a fowl for the human victim.

The Borneans call their medicine man *dayong*, which can be no other than thee Hebrew *dayyan*=judge or discerner. This Hebrew word *dayyan* we seem to find again in the *dyang* of the Nilotic tribe in northern Uganda called the Lango. This word, however, refers to cattle; it was possibly associated in the original sense of discerner, with the practice of augury from the entrails of sacrificial cattle, and by degrees this original meaning has been lost; but that this word can also apply to people is seen in the name *Lango Dyang*,

a tribe co-related with the Lango in question. However, in considering this matter, we must remember that the " Hamitic " tribes regard cattle as more or less sacred and almost on a level with human beings. Thus, for instance, a Nandi salutation is *A-'kot-ok tuka ak piik* (I salute you, cattle and people), and their word for the udder of the cow, unlike that used for the mamillary organs of other animals, is the same as that used for the female breast.

A mythical warrior-hero and demi-god called *Klieng*, figures amongst Bornean animistic beliefs, and also they have an omen-bird which they call *Kieng* (a woodpecker, *lepocestes porphyromelas*). Equivalent names to these are found again amongst the African Lango and the tribe closely akin to them, the Jaluo. The former have a spirit which they call *Chyen*, and amongst the latter we find *Chieng*, who by certain authorities is mentioned as a deity, though it seems to be their name for the sun. Here again it seems possible to link up these Bornean and African terms with those of ancient Canaan, for mention is made in Amos V. 26. of " your Moloch and Chiun " and this *Chiun* was a Phœnician deity adopted by the Israelites. *Chiun*, *Chyen*, and *Chieng*, *Kieng* and *Klieng* would surely seem to have a common origin. Another striking similarity between Bornean and African beliefs is to be traced in the woodpecker as an omen bird for amongst the Maasai, Nandi and other tribes the woodpecker is an omen-bird of considerable importance, to whom they look for directions and signs, particularly when setting out on journeys, on visiting sick people, and on going out to fight or to raid*

Amongst the Borneans a generic term for spirit is *Toh*, which plays a very important part in their religious beliefs, and the equivalent to this spirit amongst the Lango is *Jok*. Now this *Jok* figures under many aspects, just like the Bornean *Toh*, and amongst others as the particular god of the tribe, under the name of Jok Lango. Dryberg mentions him thus:—" Another very ancient manifestation of Jok is known by the name of Jok Lango, ... the name, with its insistence on the fact that he is peculiarly the Lango god, is curious, and may have been applied at the time when the tribe ursurped the ' Hamitic ' name Lango; on the other hand, while the characteristics of this particular Jok may have been ancient as affirmed, a distinctive name may not have been applied until recent years in answer to the modern *Jok Nam*, ' Jok of the river '."** The *Nam* in *Jok Nam* would seem to be the same as the Hebrew

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* A.C.H., I., 323. ** J.H.D., 220.

yam = lake or sea, and it is significant that the river Nile was also called in ancient times " the sea." In connection with this *Jok* of the river of the Lango, it is interesting to note the Bornean name *Jok* for a special crocodile. Hose and McDougall mention this in their chapter on animistic beliefs:—" In olden days Kayans used to make a crocodile of clay and ask it to drive away evil spirits; . . . . . Sometimes a man dreams that a crocodile calls him to become his blood-brother, ... Usong's uncle has in this way become blood-brother to a crocodile, and is now called " Baya " (the generic name for the crocodile), while some crocodile unknown is called Jok, and Usong considers himself the nephew of the crocodile Jok."* Dryberg does not mention if the *Jok Nam* of the Lango, their river god, has any particular concrete form, so we assume that he has merely become a vague spirit of the river; but as the river-god in ancient times was often represented as a crocodile we can only suppose that the crocodile was the *Jok Nam* and the equivalent of the *Jok* of the *Borneans*. The ancestor of *Jok* is, we venture to believe, the Edomite *Jaakan*, who, with so many others in the genealogies in Genesis XXXVI., were deified. W. R. Smith has suggested that Jaakan and the Arab god *Ya'uk* were identical, and very possibly both *Ya'uk* and the modern *Jok* of Borneo and the Lango can claim the same origin from *Jaakan*.

In quoting just above from Hose and McDougall, mention was made of a certain grave known as *rarong*; amongst the Ibans the same word is found denoting a spirit which they call *ngarong*. We seem to see here the Hebrew word *aaron* = enlightened, illumined, and thus *ngarong* may have meant " one who enlightens." The Lango have a spirit—*Jok orongo*; are we to suppose that this, too, comes from the Hebrew *aaron*? It is also curious that the Lango have a word *ading* = wizard (their other word for wizard is *ajok*) so like the Bornean *Oding*. Their word for star is *achyer*, which may well have the same origin as that suggested for the Maasai *L'akir* and the Bornean *Laki*, *i.e.*, the Hebrew *bachir*. When we take into account that the *Jaluo*, who are a brother tribe to the Lango and speaking the same language, call their god *Nyasai*—which is probably *Esau*, and that they also have *chieng*, the number of names in the beliefs of these people similar to those of the Borneans is truly remarkable. Dare one venture to suppose that the Lango peoples are another branch of the Edomites who in the general dispersion of the peoples of Canaan found their way down into Africa.

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* H.mD., II., 76.

In closing this chapter we will give the following extract from Hose and McDougall who write as follows:—

" In conclusion, we venture to make a suggestion which we admit to be widely speculative and by which we wish only to draw attention to a remote possibility which, if further evidence in its favour should be discovered would be one of great interest. We have throughout maintained the view, now adopted by many others, of which Professor Keane has been the principal exponent, namely, the view that the Indonesian stock was largely, probably predominantly, of Caucasic origin. In our chapter on animistic beliefs concerning animals and plants, and in the chapter on religion, we have shown that the Kayans believe in a multiplicity of anthropomorphic deities which, with Laki Tenangan at the head of a galaxy of subordinate gods and goddesses presiding over special departments of nature, strangely resembles the group of divine beings who, in the imagination of the fathers of European culture, dwelt in Olympus. And we have shown that the system of divination practised by the Kayans (the taking of omens from the flight and cries of birds, and the system of augury by entrails of sacrificial victims) strangely resembles, even in many details, the corresponding system practised by the early Romans. Our suggestion is, then, that these two systems may have had a common root; that, while the Aryans carried the system westward into Europe, the Indonesians, or some Caucasic people which has been merged in the ,Indonesian stock carried it eastward; and that the Kayans, with their strong conservative tendencies, and their serious religious temperament, and strong tribal organization, have, of all Indonesians, preserved most faithfully this ancient religious system and have imparted it in a more or less partial manner to the tribes to whom they have given so much else of culture, custom, and belief.

" It is perhaps not without significance in this connection that the Karens, whom we regard as the nearest relatives of the Kayans, were found to worship a Supreme Being, and have proved peculiarly apt pupils of the Christian missionaries who have long laboured among them.

" By way of crowning the indiscretion of the foregoing paragraphs, we point out that there are certain faint indications of linguistic support for this speculative suggestion. Bali, which, as we have explained, is used by the Kayans and Kenyahs to denote whatever is sacred or is connected with religious practices, is undoubtedly a word of Sanskrit derivation. Flaki, the name of the bird of most importance in augury, bears a suggestive resemblance to the German falke and the Latin falco. The Kayan word for omen is aman, the resemblance of which to the Latin word is striking. Are these

resemblances merely accidental? If more of the words connected with the religious beliefs and practices could be shown to exhibit equally close resemblances, we should be justified in saying—No.''*

These suggestions have been inserted here in full as we believe that these chapters will supply some of the evidence for which our authors are looking in support of the theories which they have put forward. We only wish to make two small comments. The probable Semitic origin of the words Bali and Flaki have already been dealt with, but we venture to think that the Kayan word for omen, *aman*, also bears a semitic character and is possibly derived from the Hebrew word *amen* meaning truth.

Whilst fully realizing the importance that should be attached to the uplifting influence of such a people as the Kayans on the pre-existing Bornean tribes (who were evidently more degraded before the arrival of the Kayans) it is impossible, on considering the evidence that has now been brought foward, to accept this influence as more than uplifting; for if, as we believe, the tribes of the Kenyahs, Klemantans, Punans and Muruts, are Edomites, they must have held their religious traditions from the first, and the influence of the Kayans therefore, would have been limited to merely reviving their ancient religious beliefs which had become lax in consequence of the level to which they may have sunk.

Chapter VIII.

EDOM AND BORNEO—HISTORICAL AND RACIAL.

We have but scanty historical data concerning the ancient Edomites, but the little we have all seems to point to them having been highly cultured with pronounced capacities for trade and commerce, and a maritime people of considerable importance. Their geographical position—at the head of the Elanitic Gulf of the Red Sea certainly supports this latter supposiion.

When the Hebrew Kingdom first came into existence, David invaded and conquered Edom, leaving Joab there for six months " until he had cut off every male in Edom " and then garrisoned the country, no doubt to prevent the possibility of fugitives returning

* H.mD., II., 255.

and consequent insurrections. The Edomites, as possessors of the valuable ports of Ezion-geber and Elath at the head of the Elanitic Gulf, had no doubt availed themselves of such posts of vantage for an extensive trade with the Indian Ocean, and by this means had achieved that importance as a sea-faring nation that tradition assigns to them. The primary reason for David's attack was probably the annexation of the Edomite ports, thus furthering his imperialistic policy by acquiring their valuable over-seas trade for his own, and we find in the records of the following reign that a merchant navy of considerable importance was established there by Solomon and his friend Hiram, king of Tyre.

The difficulties of working so far from libraries and scientific centres have already been referred to, and they are very obvious when it comes to dealing with the obscure history of such a forgotten race as the Edomites. The writer happens however to have amongst his books an old history in six volumes called " An Universal History from the Earliest Account of Time to the Present; compiled from original authors " printed in London, MDCCXXXVI. The compilers devote a chapter to the history of the Edomites, the contents of which are mostly gathered from the Biblical accounts, but reference is also made to these people under other headings. The following extracts from these authorities are given for what they may be worth, and the writer regrets that he is not in the position to attest their accuracy. Their chief value is that they distinctly show how in ancient times a tradition existed that the Edomites were a mercantile people of importance even though the reputation that they seem to have held was perhaps exaggerated and may have been embroidered with legendary embellishments in the course of time. The high state of culture and material prosperity of the ancient Edomites is referred to by ancient writers such as Strabo, Diodorus, Siculus and others, and would also seem to be confirmed by what has been revealed by modern archeological research of their ancient country and in particular of their capital Petra. Having suggested that the Edomites had risen to considerable power and wealth in consequence of their enterprising spirit in navigation and trade the authors go on to say:—" But in the very meridian, as we think, of their glory, they were humbled by conquest, and the chief of them driven from their homes by the cruelties of a foreign invasion; which, how they drew it upon them we have scarce any room to guess. (Footnote: Indeed there is but very little room to guess at what might positively have been the cause of this ruin executed upon the Edomites; but probably, David treating with them for some of the advantages of Elath and Ezion-geber, they refused to hearken to him, and thereby provoked him to wrest those important places, the only marts of the very rich commodities he wanted, out of their hands). But so it

was, that they became involved in a war with king David, in which they were defeated in the Valley of Salt with the loss of eighteen thousand men; and, though this battle seems to have decided the fate of the kingdom, yet the Edomites were not suffered to live, but were massacred wherever they could be found for six months together by Joab, who slew all the males that came into his hand; so that happy were they who could escape into strange countries. So Edom was awed by the conquerors' garrisons, wasted and depopulated, while its ancient inhabitants were dispersed into several parts. . . . . And others that dealt in shipping, took the longest way they could to escape the rage of the conqueror, and went towards, or into the Persian Gulf (see Sir Isaac Newton's Chronol. of anc. kingd. amended. p. 104, 105.): in a word, they were dispersed into all parts, there being no safety for them in their native place."* With regard to the supremacy that the compilers of the history in question claim for the ancient Edomites in the Red Sea, they say as follows:—" It is presumed that they (*i.e.*, *the* Egyptians) had anciently the sovereignty of the Red Sea, by which means they engrossed all the trade of the Indies, and other parts which were then carried on that way. (Vid. Huet, ubi supr. c. 48). They seem indeed to have been dispossessed of it, if what Philostratus (De vita Apollonia, l. 3. c. 35.) relates be true, by a certain prince named Erythras, (who some imagine to be the same with Esau or Edom) for he being master of the Red Sea, made a law, or regulation, that the Egyptians should not enter that sea with any ships of war, and with no more than one merchant ship at a time. To evade which the Egyptians built a vessel so large and capacious, that it might supply the place of several."** and again " . . . . . we observe the Edomites to have been so well able to defend the right they claimed of the Empire of the Red Sea, that the Egyptians were anciently unable to dispute it with them, and were obliged to submit to such conditions as the Edomites were pleased to allow them, which are said to have been hard enough; for they were allowed but one vessel of burthen wherewith they sailed to the Indies, and not so much as one galley. Elath was particularly so considerable a place as to give name to the easternmost of the gulfs which terminate the Red Sea, and had the famous metropolis of Petra, ten miles to the westward of it (Euseb. Onon Urbium and Locorum ad vocem Anod.), as is said from very good authority which has been followed by some geographers of first note."† It is improbable that

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* A. H., Vol. I., 314, 315. ** ID., 226. † ID., 310.

Edom ever held such absolute and autocratic sway over the Red Sea, but it is quite possible that she made some agreement with Egypt by which she undertook the Eastern carrying-trade for that nation, for the Egyptians themselves never seem to have been great seamen. The Western trade was at one time undertaken chiefly by the Phœnicians, and we know that as early as about 1250 B.C. the Phœnicians had been allowed to form a colony at Memphis, the head-quarters for the overseas trade, and had built a temple there, dedicated to their goddess Ashtart, and perhaps that it was owing to some such alliance between Edom and Egypt, and the consequent settlement of large numbers of Edomites along the coast, that their deity Usoos and his female counterpart came to be included in the Egyptian pantheon. As to the possibility of the Phœnicians themselves having settled on the Red Sea, Professor G. Rawlinson says:—" But the only indication which we have of any such settlement is contained in the name ' Baal-Zephon,' which is Phœnico-Egyptian, attached to a place on the border of the Gulf of Suez (Exod. xiv. 2, 9; Num. xxxiii. 7.); and this indication is too weak to be regarded as actual proof They may at some periods have held possession of Elath at the head of the Gulf of Akbak (I Kgs. IX. 26, 28; XXII. 48.), whence they seem to have made joint voyages with the Israelites; but Elath was usually claimed and held by Edom."*

Too little credit, it would seem, has been accorded to the possibilities and probabilities in remote antiquity of maritime enterprises in the direction of the Indian Ocean and beyond, and also to the needs for colonization that must have arisen from time to time amongst the peoples of Western Asia, crowded as they were within an area, the habitable portion of which was about the size of present-day France. That these peoples required outlets for their superfluous population is obvious, and it is only natural to suppose that those who held access to the sea would have found such an outlet in over-seas colonies. We find that early in their history the Phœnicians were founding colonies; first within the bounds of the Mediterranean, but later they extended their colonizing enterprises into the land on the Atlantic, as far north as the Scilly Isles and Cornwall, where they had established a settlement in order to work the tin and copper ore there. The same was the case with the Greeks, who, fairly early in their history, found their land too small and were obliged to send out their superfluous population to found colonies both in other parts of the Mediterranean and on the shores of the Black Sea. This need for expansion is seen in the first place from the migrations at a fairly early date from the over-crowded regions of Mesopotamia of the

* G.R., 70.

peoples who founded the kingdom of Syria, of the Phœnicians, and again of the Hebrews from Ur of the Chaldees. What actually caused the migration of the Phœnicians from their early abode on the Gulf of Persia to the borders of the Mediterranean, is not known, but it is possible that they were evicted from their position by a stronger race who, coveting the valuable over-seas trade that they had founded, took it for themselves, exactly as at a later time king David of Israel evicted the Edomites from their position on the Elanitic Gulf of the Red Sea.

It would seem that, in the centuries preceding the Christian era, the more southern portions of India and also Ceylon were being colonised by the nations of northern India, which shows that possibilities existed for colonies being established there at an earlier period by the peoples of the Gulf of Persia and the Red Sea, though to what extent they may have availed themselves of these possibilities we cannot tell. Already, in very early times, the people of Mesopotamia had founded a flourishing over-seas trade beyond the Gulf of Persia, and that they must have been extremely enterprising, can be gathered from the fact that the first Sargon records in his inscriptions that his ships sailed across the western sea, *i.e.*, the Mediterranean. The Egyptians traded by sea with the land of Punt a thousand years earlier than this. It is most probable that the Phœnicians, while still a sea-faring people on the Gulf of Persia, should have founded colonies in distant parts of the Eastern seas just as they did at a later period in the Atlantic. King Solomon's navy which sailed from Ezion-geber to Tarshish for gold and silver, ivory, apes and peacock's, went out every third year, and as it cannot be supposed that they laid up for longer periods than necessary in the home ports, these voyages will have carried them very far afield, for had they merely sailed within the limits of the Arabian Sea and the western coast of India they would have been home within the year. These voyages must, therefore, have been undertaken into regions well beyond Ceylon, or into any part of the Bay of Bengal, and, when it is considered that the distance from Ceylon to the Straits of Malacca is about the same as from Palestine to the Straits of Messina, Solomon's fleet could easily have sailed as far as into the Malay Archipelago and even into the Pacific and back again within the limit of the three years. That Tarshish should have been either the Tarsessus in Spain, or Carthage, as some have supposed, is out of the question when both the character of the merchandise and the duration of the voyage are considered. In this connection Ophir should be mentioned. There is no reason why Josephus should not have known what he was talking about when, speaking of Solomon's fleet, he says that it went " to the land that was of old called Ophir, but now the Aurea Chersonesus which belongs to India, to fetch him gold." The

manner in which Josephus makes this statement certainly implies that the whereabout of the Aurea Chersonesus, its being identical with the ancient Ophir, and the fact that it belonged to India though it was not India proper, were well established facts in his day, and that it was a land famous for its gold is evident from the name that was given it in later times. It is most improbable that Solomon's sailors were pioneers and we can take it for granted that the Edomites had already laid the foundations of the trade which the Israelitish-Phœnician fleet took over, and very possibly in these distant parts the Edomites had already founded colonies to which those would have fled who escaped by sea from the ruthless treatment that was accorded to their conquered land by King David. That the Edomites should have had settlements as far afield as the Malay and the adjoining archipelago is really quite as possible as that the Phœnicians should have had a colony in Britain. What other settlements may have been founded in the Bay of Bengal, the Indies, or even beyond, as a result of the great wars that for centuries so ruthlessly harassed the peoples of Western Asia is a very interesting field for conjecture; that those who lived on the sea-boards of the Gulf of Persia and the upper end of the Red Sea and thus had the disposal of shipping made use of this in order to escape from their oppressors, is most probable. In this manner the people of Sidon fled and took refuge in Tyre when they were attacked by the Philistines, and our eighteenth century historians appear to know that the Edomites made use of their shipping to get away from the brutal treatment of Joab.

The possession of ships suitable for these long voyages need hardly be questioned, nor the knowledge of the ancient navigators, which was doubtless quite as efficient as that of the Vikings who sailed to Iceland and Greenland, and, as it is believed, also to America, or of Columbus in the 15th century. We know that about 4000 B.C. the Egyptians were building ships 170 feet in length, and almost as early as that they traded with the countries at the southern end of the Red Sea; there can hardly be any doubt that the art of shipbuilding must have developed between that time and 1500 B.C. With regard to sailing in the Indian Ocean we need only consider the trade carried on at the present day between India and the coast of Africa in the small Arab dhows, to appreciate what was possible to those earlier mariners whose civilization and knowledge was certainly greater than that of the men who ply this trade to-day. A far more remarkable and romantic phenomenon of navigation and colonization than that which has been suggested above is pointed out by Perry as having taken place in the Pacific in early times in our era. Here it was the question for the first explorers of finding infinitesimal spots in the huge wilderness of the Pacific Ocean and that without the guidance or shelter of any continental coast-lines. We give the following short

quotation from Perry and a glance at the map will explain the rest. " The Polynesians are first heard of in Samoa and Fiji, which is half Polynesian and half Melanesian, about A.D. 450. . . . . About the year A.D. 650, great voyages of discovery began from this region out into the eastern Pacific. Tu-te-rangi-atea, brother of Hui-te-rangiora, first reached Tahiti, and built a great house in the island of Raiatea, probably the great marae of Opoa which was celebrated all over eastern Polynesia as the sacred meeting-place of all the tribes of those parts.' Many islands were discovered by these men from the west, and a list of them is preserved in the genealogies. Hawaii was settled in A.D. 650, so far as can be told. ProbablyEaster Island was colonized about then; and the Marquesas in A.D. 675. The date of the first colonization of New Zealand is uncertain; it may have been visited during the first great movement out from Fiji and elsewhere about A.D. 650 in the time of Hui-te-rangiora. Mention is made of the visit to New Zealand of a Polynesian voyager, Maku, about A.D. 850; but Maori nobility trace their descent to men who came from Raratonga about A.D. 1350."*

Before closing this chapter we wish to indicate the possibility that the physical type of the Borneans may not differ so much from that of the ancient Edomites as might, on first consideration, be expected. The physical types of the Borneans require to be noticed; we will, therefore, give the following particulars gathered from Hose and McDougall. Leaving on one side, for a moment, the fact that the Ibans and the Kayans constitute, in a way, a separate group, and also that they immigrated into Borneo at a more recent date, we learn that " from a very early period the island has been inhabited in all parts by a people of a common origin whose surviving descendants are the tribes we have classed as Klemantan, Kenyahs, and Punan. . . . . It seems not improbable that at this early period, perhaps one preceding the separation of Borneo, Sumatra, and Java from the mainland, this people was scattered over a large part of this area. For in several of the wilder parts, where the great forest areas remain untouched, bands of nomads closely resembling the Punan of Borneo are still to be found, notably the Orang Kubu of Sumatra, and perhaps the Bantiks of northern Celebes. . . . . It is impossible to make any confident assertion as to the affinities of this widely diffused people from which we believe the Punan, the Kenyahs, and Klemantans to be descended, but the physical characters of these tribes, in respect of which they differ but slightly from one another, lead us to suppose that it was formed by a

* W.J.P., 106.

blending of Caucasic and Monogoloid elements, the features of the former predominating in the race thus formed."*

The *Kayans*, according to tradition, arrived in Borneo in the fourteenth century, or at no distant date in history. They are supposed to have migrated to Borneo from the base of the Irrawadi by way of Tenasserim, the Malay Peninsula, and Sumatra. The *Kayans* are thus represented as being of the same stock as the *Karen*, the Chins, and the Kakhyens of Burmah, as also of the *Nagas* of Manipur and of the Naga Hills of Assam. " It seems highly probable that all these, together with the Kayans, are surviving branches of a people which occupied a large area of south-eastern Asia, more especially the basin of the Irrawadi, for a considerable period before the first of the successive invasions which have given rise to the existing Burmese and Shan nations. The physical characters of all of them are consistent with the view taken above, namely, that they represent the original Indonesian population of which the Klemantans of Borneo are the pure type, modified by later infusions of Mongol blood. In all these occur individuals who are described as being of almost purely Caucasic type and very light in colour.**

The general conclusion would seem that these peoples are an admixture of Caucasian and Mongoloid elements in which the former strongly predominates.

On the assumption that certain of the tribes of Borneo may be ancient Edomites, we venture to suggest that the admixture of *Caucasic* and *Mongoloid* blood may already, in the main have taken place prior to their leaving the land of their origin, Western Asia. The possibilities that existed in ancient Canaan for the forming of mixed races was seemingly unlimited when one takes into account the different peoples that existed within its borders and in the countries immediately adjoining. We thus find living intermixed, or as near neighbours, the following elements. Besides the Semites, *i.e.*, the Hebrews themselves, there were the Amorites—a blonde race with blue eyes, light, red hair, and handsome regular features—, the Philistines—a people supposed to have come from Krete via Egypt—, the ancient, pre-historic, neolithic Canaanites, and, not least, the Mongoloid Hittites. Close to their borders were the Egyptians and the " Cushites " or black-skinned negroes, and the Nubians. With all these peoples the Edomites would have come in more or less close and intimate contact, though above all with the Amorites, who

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* H.mD., II., 225, 226. ** ID., 237.

were, it is believed, identical with the Horites, and with the Hittites, their near neighbours to the north. They seem from the first to have had very little dealings with their Semitic kinsmen the Israelites.

Esau, the ancestor of the Edomites, was, according to the little we know of him, an interesting and curious character. He evidently set no store by the traditions of his race; he despised his birthright, and, when he came to marrying, he rejected the women of his own people, and of his wives, two were Hittites, one a Horite, another an Ishmaelite, who, though a grand-daughter of Abraham, was by an Egyptian mother. Esau himself was " red," and this is possibly explained by the fact that his mother was a Syrian with probably an infusion of " blond " Amorite blood. Of the Hittites, modern archeological research has much to tell. What is of particular interest is that *they were of a Mongoloid type*, and, if we are to believe the Egyptian paintings, *their skins were yellow*. In a little book, recently re-issued, Professor Sayce speaks of the Hittites, " with their yellow skin and Mongoloid features," and says:—" Mr. Tomkins has called the Hittite face ' snouty.' It is marked by an excessive prognathism, which we look for in vain among the other populations of Western Asia. The nose is straight, though somewhat broad, the lips full, the cheek-bones high, the eyebrows fairly prominent, the forehead receding like the chin, and the face hairless. . . . . In figure the Hittite was stout and thick-limbed, and apparently of no great height."* We are further told that, besides his skin being yellow and his features Mongoloid, his hair and eyes were black. It would appear that in the days of Abraham and his immediate descendants, no other Semitic peoples existed in the southern portions of Canaan, and therefore Isaac, and his son Jacob also, were obliged to go to their kinsfolk in Syria to get wives of their own race. This, as we have seen, Esau did not trouble to do, and in all probability his sons and further descendants considered the question of race as little as he did himself. That no friendship existed between the Edomites and the Horites amongst whom they lived, is evident from from the fact that they fairly soon destroyed them. (Deut. II. 12. 22.). A certain portion of them they possibly absorbed. Though Esau himself took a Horite woman for a wife, his sons evidently did not consider them good enough for them, for we find that Eliphaz had a Horite only as concubine, even though she was the daughter of one of their chiefs (Gen. XXXIV.); this would seem to indicate that the Edomites took their wives elsewhere. That they would have followed the example of their ancestor and in many cases sought them amongst the

* A.H.S., 192.

daughters of the Hittites, their near neighbours in southern Judea is probable, and in this way the Edomites would have gained a strong infusion of Mongoloid blood and racial characteristics. It was no doubt from this Hittite colony that Esau had obtained his two first wives, Adah and Judith.. It is particularly interesting to note the portion of this settlement located on and around Mount Hebron, for it became the possession of the Edomite clan of the Calabites. It is significant that Caleb the spy, who was an Edomite of the tribe of Kenaz, made a special request that Mount Hebron, which would have included the surrounding district, should be given to him as his inheritance in reward for his services. That he particularly chose this portion may have been due to the fact that he and his people had been intimately allied with the Hittites of that district whom he may have wished to save from the wholesale extinction that the Israelites endeavoured to mete out to the peoples of Canaan, for we find that he made a special point of driving away the other people who were established within the region of his new domains (Jos. XV. 14.). In all probability the Edomites had always been on terms of friendship with their near neighbours, from whom the father of their race had chosen two of his wives. It may also be supposed that at the approach of the ruthless Israelites a certain portion of the Hittites fled and took refuge with the Edomites. Thus much points to the probability that the Edomites had a strong admixture of Hittite blood, and with the absorption of a portion of the Horites—who, as we have said, are believed to have been of the same race as the Amorites, as well as with slighter admixtures with other Canaanitish races and possibly with the Egyptians, they were certain a very mixed race, which may, like the Borneans of to-day, be broadly described as of Caucasic and Mongoloid origin, the former strongly predominating.

Chapter IX.

CONCLUSION.

Before bring this to a close we wish to point out some other customs amongst the peoples which have now been considered, as they seem to be closely related to those of the ancient Western Asiatics and Egyptians.

There is a curious bridal custom of the Bunyoro's in the Uganda Protectorate; when the bridegroom gives his promise that he will care for the bride, he confirms this promise by placing his

hand on the inside of her thigh. We find the exact equivalent in Gen. XLVII. 27. where Jacob in making his son Joseph solemnly promise that he would take his body back to Canaan to be buried there, made his son place his hand on the inside of his thigh when the promise was given.

It has been seen how bark-cloth is used in Africa in connection with the burial of the dead. Bark-cloth is also used by the Bornean tribes and worn when in mourning. This material seems to be the equivalent of the sack-cloth worn in mourning by the ancient Hebrews, and it is very probable that this sack-cloth was made out of the bark of trees and was the same as the bark-cloth made to-day by the natives of Africa and Borneo.

We should like to call particular attention tc the Bornean custom of jar-burial, which is so strikingly typical of ancient Western Asiatic and later-day Egyptian practice.

The Bornean customs relating to adoption are very reminiscent of ancient Hebrew practice. " When the appointed day arrives the woman sits in her room propped up and with a cloth round her, in the attitude generally adopted during delivery. The child is pushed forward from behind between the woman's legs, and if it is a young child, it is put to the breast and encouraged to suck."* The Egyptian custom of sucking at the breast as a rite in the ceremony of adoption has already been noticed, but the earlier portion of the procedure now described is best compared with the Hebrew practice related in Gen. XXX. 3. " and she shall bear upon my knees that I may also have children by her." The intention in both cases is obviously the same, *i.e.*, to suggest by various outward acts the fact that the child adopted is to be looked upon as if it were *physically* the child of the woman who adopts it.

Again, the customs of the Borneans, very similar to those of the African tribes under review, with regard to purifications after battle, after death, etc., and of the worship at the time of the new moon, are typically Western Asiatic.

The custom of removing all hair from the face and body, we find, both amongst the natives of Kenya Colony and those of Borneo, was a well-known practice in ancient Egypt and probably also amongst the Canaanitish peoples.

When considering ceremonial customs and laws amongst native tribes, it has been usual in the past for Europeans who have come in intimate contact with certain natives to compare these with those of the Mosaic law, with the result that much speculation has

* H.mD., I., 78.

arisen as to whether the native tribes in different parts of the world may be the dispersed tribes of the Israelites. It is far from the writer's intention to dispute such possibilities; he only wishes to point out that these particular similarities, which we have already noticed, are by no means sufficient evidence in themselves to prove the exact origin of such tribes; such evidence can only be of secondary importance, and only of value as support for other proofs, and for this reason native ceremonial customs have been dwelt but lightly on in these pages. It is well to mention that the ceremonial law found amongst some of the tribes of Africa, strongly reminds one both in the completeness of its organization, and in many remarkable details, of the Mosaic law, even though it is apparent that it has, with the course of time, undergone the same process of degeneration as we find to be the case in a more general way with everything else connected with these people. It must be remembered that Mosaic ceremonial law was to a great extent founded on the code of Khammurabi—to which no doubt the ceremonial laws of Egypt were very similar—modified and purified, and given to the Jews as a concession, in place of the far simpler form of service which, one realizes, is the ideal that is the foundation of the pure worship of the one God Jehovah. The code of Khammurabi from about 2000 B.C. and onward governed all the peoples of Western Asia, and, in its more degenerate form, it would appear to be governing " native " tribes in almost every portion of the world to-day. That the peoples of Western Asia were scattered to the " four winds " as the result of centuries of ruthless warfare, when tribes and peoples were carried away into captivity or fled to escape this dreaded fate, is undoubted, and this study seems to show that they have wandered very far afield. Indeed, the extent to which they may have travelled, carrying with them their Western Asiatic civilization in its simpler forms and peopling and colonizing the most widespread and far distant parts of the globe is probably much greater than one has dared to imagine.

The writer ventures to state his belief that not only all the so-called " Hamitic " and " Nilotic " tribes of Kenya Colony, but also such tribes as the Kikuyu, Akamba and other allied races, are Western Asiatics, who have in historic times immigrated into this portion of Africa. And he believes further that these Western Asiatics—peoples of Canaan and Syria in particular—are to be found scattered over wide portions of the continent of Africa and even far down into the south.

The very changed physical characteristics of these peoples may, the writer believes, be partly ascribed to the changed environment and conditions of life which came about on their migrating into these regions, and that the circumstances which, not least, effected such

alteration of physical type, may be sought in the flagrant violation of so many of the laws of nature, such as that of completely shaving the head from earliest childhood, and of exposing all parts of the human body to the full force of a tropical sun. Such serious infractions of natural laws must inevitably produce a corresponding violent re-action on the part of nature, in order to bring about a modification of the physical frame to enable it to conform to new conditions. No doubt, too, their moral and mental degradation will have had something to answer for in this respect. But another factor to be taken into consideration in this connection, and one that has in all probability had very far-reaching results in the formation of present-day racial characteristics amongst those African tribes which we have been considering, is that of the action of the law of the survival of the fittest. Infant mortality amongst these African natives is, as is well-known, very high, and, in all probability, it has always been so. That the Semitic and other Western Asiatic tribes which have wandered down into Africa have suffered an infusion of Negro blood is evident, but we do not believe that this has been so great as to account directly for the proportion of negroid characteristics to be found amongst these tribes to-day. We are rather inclined to believe that under the law of the survival of the fittest, the negroid blood has survived at the cost of the Asiatic, as more resistant to the diseases and the rigorous climatic conditions of tropical countries.

Another point that particularly interested the writer in connection with the present study, is the importance of establishing what is the true relationship between food-producing peoples and food-gathering peoples. He feels it is of vital consequence if a correct understanding of the problems of the spread of civilizations and the distribution of mankind over the surface of the earth is to be obtained. In the course of his studies a good deal of light has been thrown on this subject. We have already referred to the drawbacks of working out the problems dealt with in this review, when far from the great centres of civilization and science, with all the facilities that they hold; but there are also some counter-balancing advantages in being on the spot, surrounded by native life, and living as the writer does in touch both with food-producing and food-gathering tribes, and he has been able to arrive at certain conclusions with regard to their relation to one another which he believes to be of value, and which he hopes to publish before long. He only wishes to add here that he is convinced that the food-gathering tribes of this portion of Africa are not any more " primitive " than are the food-producing tribes but that instead, they are, as he hopes to show, only more degenerate than the others. Curiously enough the study of this question would seem to produce

further evidence in support of what may have been proved here as to the origin of the native races which are the subject of this review.

But, if the writer's thesis proves to be correct, another point of interest of quite a different character arises, namely—the possibility of visualizing and reconstructing much in the life and mentality of the ancient peoples of Egypt and Western Asia, through the study of, and by comparison with the life and mentality of native tribes to-day. When all due allowances for cultural degradation are made, there seems to be a residue common both to the modern, degenerated descendants, and to their ancient ancestors which is remarkable.

In bringing this to a conclusion the writer feels that he cannot do better than subscribe to the opinions expressed in the following quotations from Perry's " The Children of the Sun ":—

" The general attitude and methods of this school of thought have been well summarized by Rivers in his small pamphlet on " History and Ethnology," which should be universally read by those interested in these studies. He speaks of the time, ten years or more ago, when the historical method of study began under the influence of himself and Eliot Smith. ' At this more remote period anthropology—I use the term anthropology advisedly—was wholly under the domination of a crude evolutionary standpoint. The aim of the anthropologist was to work out a scheme of human progress according to which language, social organization, religion, and material art had developed through the action of certain principles or laws. It was assumed that the manifold peoples of the earth represented stages in this process of evolution, and it was supposed that by the comparative study of the culture of these different peoples it would be possible to formulate the laws by which the process of evolution had been directed and governed. It was assumed the time-order of different elements of culture had been everywhere the same; that if matrilineal institutions preceded patrilineal in Europe and Asia, this must also have been the case in Oceania and America; that if cremation is later than inhumation in India, it has also been later everywhere else. This assumption was fortified by attempts to show that there were reasons, usually psychological in nature, according to which there was something in the universal constitution of the human mind, or in some condition of the environment, or inherent in the constitution of human society, which made it necessary that patrilineal institutions should have grown out of matrilineal, and that inhumation should be earlier than cremation. Moreover, it was assumed as an essential part of the general framework of the science that, after the original dispersal of mankind, or possibly owing to the independent evolution of different

main varieties of Man, large portions of the earth had been cut off from intercourse with others, so that the process of evolution had taken place in them independently. When similarities, even in minute points of detail, were found in these regions, supposed to be wholly isolated from one another, it was held that they were due to the uniformity in the constitution of the human mind, which, working on similar lines, had brought forth similar products, whether in social organization, religion, or material culture."

" This position is being hotly contested, as is evident to any reader of this book. As Rivers says in the pamphlet just quoted, when speaking of the rise of the historical school, and of its attitude towards the older " evolutionary " school of thought: ' The adherents of the recent movement to which I have referred regard the whole of this construction with its main supports of mental uniformity and orderly sequence as built upon the sand. It is claimed that there has been no such isolation of one part of the earth from the other as has been assumed by the advocates of independent evolution, but that means of navigation have been capable, for longer periods than has been supposed, of carrying man to any part of the earth. The wide-spread similarities of culture are, it is held, due in the main, if not wholly, to the spread of customs and institutions from some centre in which local conditions favoured their development.' This group challenges the other to show that it is right in using evidence indiscriminately from all over the earth without regard to time or place, and demands stricter canons of evidence. It asserts that it can be shown that certain less advanced communities are derived from those more advanced and wants to know where such a process stops.

" The quarrel therefore, between the two schools centres round culture degradation. Tylor recognised the importance of this process. He remarks that:—' It would be a valuable contribution to the study of civilization to have the action of decline and fall investigated on a wider and more exact basis of evidence than has yet been attempted. The cases here stated are probably but part of the long series which might be brought forward to prove degeneration of culture to have been by no means the primary cause of the existence of barbarism and savagery in the world, but a secondary action largely and deeply affecting the general development of civilization! . . . . *

The writer hopes in his next publication to show what this primary cause may have been.

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* W.J.P., 467-469.

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THE EAST AFRICA & UGANDA NATURAL HISTORY SOCIETY,
FINANCIAL STATEMENT, 1925.

Receipts.	Shs.	Cts.
By Balance at National Bank of India and cash on hand 31/12/24	2,029	13
,, Subscriptions, 1925	4,760	82
,, Entrance Fees	496	00
,, Life Members	1,130	00
,, Subscriptions for 1923 ...	30	00
,, ,, ,, 1924 ...	180	00
,, ,, in advance ...	120	00
,, Donations—General ...	85	00
,, Martin Johnston Film ...	1,123	50
,, Conscience Money	300	00
,, Donations—Building Fund ...	30	00
,, Sale of Journals	295	00
,, Visitors to Museum	496	50
,, Government Grant ...	3,000	00
Shs.	14,075	95

Expenditure.	Shs.	Cts.
To Upkeep and General Expenses	462	75
,, Cost of Journals	5,285	25
,, Additions to Furniture ...	4,511	90
,, Wages	288	00
,, Exchange on Cheques ...	6	05
,, Rent	60	00
,, Light	13	00
,, Insurance	201	00
,, Return of Subscriptions paid twice	60	00
,, Rent fine overdate	10	00
,, Expenditure of Government Grant (balance 72/50 shown in Furniture)	2,927	50
,, Balance at Bank 31/12/25 ...	236	60
,, Cash in Hand	13	90
Shs.	14,075	95

(Sgd.) J. GRAHAM DAWSON,
Hon. Treas.

THE ANNUAL REPORT, 1925.

General.

The activities of the Society during the period under Review have been somewhat restricted, and have been confined almost entirely to the improvement of the exhibited collections in the Museum.

Exhibits.

Several additions have been made, the most noteworthy of which are:—An exceptionally fine female Rhino Horn, the gift of Lord Egerton of Tatton; the whole of the Coryndon Collection of game heads—including many extremely good examples of South African Antelope, presented by Lady Coryndon; the extension and remounting in natural habitats of the "Game Birds," including Duck and Francolin, etc.; the addition of several smaller Mammals and Birds.

The Society has received on loan from the Government an interesting pair of tusks from a Dwarf Elephant, which is possibly new to Science.

Study Collections.

The most noteworthy addition to the Study Collections are:—An almost complete skin of he rare Eastern race of the Yellow-backed Duiker, presented by I. Q. Orchardson, of Kericho; several hundred Coleoptera from Kenya and Uganda, which have been kindly arranged and incorporated by Mr. A. F. Gedye.

Propaganda.

The Society was instrumental in bringing to Government notice the urgent need of some measure of protection to "Game Birds." It is understood that Government has now under consideration a draft Ordinance empowering the Governor by proclamation to declare definite close seasons for certain species.

The Martin Johnson Game Film was exhibited in Mombasa during the year; the proceeds being devoted to Museum furnishings.

The Public Health Propaganda Films on Malaria and Hookworm were loaned to the Society by the Zanzibar Government. These films were exhibited in Nairobi to all sections of the community.

Arrangements have now been made with the Medical Department to show them in various towns throughout the country.

FINANCIAL.

It is gratifying to report that the Government grant to the Museum has been increased from £150, to £200 during 1926.

Subscriptions from members have shown a slight falling off, but it is anticipated that a considerable amount now in arrears will be recovered.

The income of the Society from all sources amounted to over £700, and after meeting all expenses there remains a balance of Shs. 236 to our credit.

CORYNDON MEMORIAL.

Shortly after the death of our late President and Governor, Sir Robert Coryndon, a meeting of representatives of Public bodies was called to discuss the feasibility of establishing a memorial, to commemorate Sir Robert's sterling services to the Colony. It was decided that the Memorial should take the form of an addition to the Museum Building, to be known as the Coryndon Hall. A public appeal for funds for this object was issued by an Executive Committee on which the Society is represented. We take the opportunity of bringing this Fund to the notice of members in the hope that they will subscribe most generously to an object which will not only commemorate our late President, but also enhance the utility of the Society's Museum.

PUBLICATION.

Four journals have been issued during the year, including the preliminary Sections dealing with the Birds and Lepidoptera of Kenya and Uganda. The cost of the journals is very high, especially in respect of reproductions and plates; we therefore ask members to subscribe to the special " Illustration Fund " in order that the value of the papers may be maintained.

The Journal
OF THE
EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY

November, 1926. *No. 27.*

CONTENTS.

EDITOR OF JOURNAL:
Dr. V. G. L. van Someren.

Additional copies to Members, Shs. 6/-; to non-Members, Shs. 10/-.

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The Journal

OF THE

EAST AFRICA AND UGANDA NATURAL HISTORY SOCIETY

November, 1926. *No. 27.*

Photo: Capt. Blencowe.

QUAIL DECOYS, KAVIRONDO.

THE BIRDS OF KENYA AND UGANDA.

Part IV.

by

V. G. L. van Someren, m.b.o.u., etc.

Part four of the series on the Birds of Kenya and Uganda completes the Francolin and Quail. We do not claim that the notes so far published are complete, since they are based almost entirely on the observations and records of one individual; we therefore take this opportunity of suggesting to members that if they have records or notes connected with the birds dealt with in the series, these should be communicated to the Editor and made available to fellow members.

PHASIANIDAE.

Genus—**PTILOPACHUS.**

Ptilopachus petrosus florentiae, Og. Grant. Kenya Rock Bantam.
P.p. keniensis, Mearns, Syn.
Ref. Og.-Grant, B.B.O.C., lxxiii., 1900.
Type locality, Gessema, Northern Frontier.

Distribution: Rocky hills N.W. Northern Guasso Nyiro, Matthew's Range, west to Ngobotok and Suk; Rudolf and Moroto to Kakamari in Karamojo.

Description: Male Adult.

Head and neck brown, each feather with a dark shaft streak, greyish white margins inwardly accentuated with dark brown. The feathers of the supercilium and forehead, narrow and pointed. A large bare red patch surrounds the eye. Earcoverts uniform brownish. Feathers of lower neck and chest lighter ochreous-brown with wide white margins and distinct shaft streaks and sub-marginal line. The sub-marginal black tends to invade the marginal white in the feathers of the breast. Mantle, scapulars, coverts, and rump, blackish brown vermiculated marginally with whitish and centrally with ochreous and black. Upper tail-coverts similar but vermiculations much finer. Outer webs of primaries and secondaries blackish-brown vermiculated with lighter brown; rectrices likewise vermiculated.

Centre of breast uniform buff; sides of breast and flanks brownish buff with irregular marginal bars of white and blackish, and with central chestnut and black shaft-streaks. Abdomen blackish-brown with ill-defined greyish-buff barring. Under tail-coverts blackish-brown with fine lighter brown vermiculations towards ends.

Thighs greyish-brown with black and buffy barring. Base of bill, dull crimson, shading to horn-yellow at tip of mandibles. Legs dull coral red, or pink, toes darker. Iris ochreous-brown.

FEMALE:

Very like the male but smaller and with less brownish-chestnut on the flanks.

JUVENILE:

The half-grown young is more heavily barred on the flanks, breast, and mantle, and shows only a trace of the buff breast patch.

HABITS:

This curious Francolin which is so extraordinarily like a " Bantam " fowl is, as its name implies, an inhabitant of the rocky mountains and Kopjes of the drier parts of Kenya and Uganda. Rough boulder-strewn, bush-covered hillsides form its principal habitat, and in such a place it is difficult to procure. It is loth to take flight—instead it runs and scrambles from rock to rock, or dodges in and out of the boulders with such speed that a " snap-shot " is the only possible chance of securing the bird.

My head collector reports that stalking and " lying-up " offer the best chance of getting in touch with this bird. The agility of the Rock-Bantam is remarkable—they think nothing of scaling a rock-face which is almost perpendicular. When excited, the bird carries its tail in a vertical position, with feathers somewhat compressed, and with the long coverts of rump and tail shed to either side. In this attitude the bird is like a cock Bantam. The call is a whistling wee-hi-u.

One meets with these birds in pairs or small coveys of six to eight, and in favoured localities there may be more than one covey on the hillside. We have not taken the eggs, but Admiral Lynes describes those of the race *emini*, as " pale stone-colour " with a matt surface, laid in a shallow depression at the base of a tree or stone; well concealed.

The food consists of green shoots, seeds, and insects in their larval form.

Ptilopachus petrosus emini, Neum. Emin's Rock-Bantam.
Ref. Neum.
Type locality, Fadiloek, Nile Prov.
Distribution: Uganda, north-western area, Nile Province.

Description: Male Adult.

Differs from the race *florentiae*, in being less dark brown above, and with finer black bars on the flanks. The centre of the feathers on the mantle and back are chestnut; while the flanks have wide chestnut shaft-streaks.

Female:

Very like the male but smaller, and with less chestnut on the flanks.

Juvenile:

I am unacquainted with the young, neither does there appear to be a description of it.

Habits:

As for the previous race.

Genus **COTURNIX.**

Coturnix coturnix coturnix, Linn. Common, or European Quail.
Ref. Linn. Syst, Nat., 1758.
Type locality, Sweden.
Distribution: A winter migrant to Uganda and Kenya.

Description: Male Adult.

Forehead and crown blackish-brown, each feather with wide buffy brown tips. A buff line runs down the centre of the crown to the naps where it expands and is broken up. Lores and supercilium white or buffy white, the supercilliary line extending to the sides of the nape. A brown line extends from just above the gape, below the eye through the lower part of the earcoverts, then down the side of the neck. Chin and throat white or buff, the latter with a wide central black wedge-shaped mark, base downwards, from the lateral aspect of which the black extends upwards in a curving line to the ear-coverts; thus dividing the white of the throat. Back and sides of the neck rufous-brown, with black blotches and white shaft-streaks. Exposed portions of feathers of the upper side blackish-brown, with rufescent or brown-buff bars and tips, finely vermiculated with greyish; centre of feathers of mantle, back, scapulars and upper tail-coverts with sharp-pointed buff shaft-streaks outlined with black; those on the mantle narrow. Wing-coverts olive-brown with buff bars and whitish shafts; lesser coverts olive-brown with buff tips. Primaries and outer secondaries tipped and barred with buff; inner secondaries with black and buff bars extending across both webs.

Chest and upper breast orange ochreous, with white or buff shaftstreaks and tips. Sides of breast and flanks buff with wide

whitish-buff shaft-streak outlined with black and chestnut; margins tail-coverts buff. Wings 100-115 mm.

Female:

Above as in the male; throat without the central black area but black lateral lines sometimes present, often reduced to a few black spots. Chest buff, with narrow white shafts, and some blackish blotches; rest of underside as in the male, but with slight barring on the breast. Flanks not so decidedly coloured and with rather more distinct black marks. Bill greyish brown, legs and toes yellowish-pink; Iris light brown.

Juvenile:

Very like the female, but stripes on the back much narrower, and the underside has a more mottled appearance.

Habits:

The European Quail has seldom been recorded from Kenya or Uganda. We have taken them in parts of Busoga, and Stoneham states " they are common " during the winter months in the Mtama fields near Kitgum, Nile Province. In Kenya we obtained specimens from the Athi Plains, Loita, and Serengeti, Kisumu area, at Shimoni on the coast, and again on the Juba River. Records shew them to be here in November and to remain till March.

Grasslands and cultivations are the haunt of this bird. They are close squatters and are flushed with great difficulty; this characteristic no doubt accounts for the fact that the species has seldom been taken.

During a visit to Kavirondo I came across a set of Quail snares and " call birds," in baskets. The birds were calling lustily, but there was a peculiarity in some of the calls which attracted my attention. I got the boy in charge to lower the baskets, and in three out of twelve, were European Quail, two males and a female. I sent for the owner and questioned him about the birds; he knew they were different from the rest, being larger and paler, but what pleased him most was, " their call attracted the wild birds better."

They had been in captivity two years!

The European Quail has two calls, a soft " pew-pew " uttered by both sexes when feeding; and the call of the male which is somewhat like " wet-twi-twit."

The species does not breed in either Kenya or Uganda. The food consists largely of seeds and fresh vegetable matter, but insects are also eagerly sought for.

Coturnix coturnix africana, Temm. and Schl. African or Cape Quail.
Ref. Temm. and Schl. F. Jap., 1850.
Type locality, South Africa, Cape.

Distribution: In suitable localities throughout Kenya and Uganda.

Description: Very like the European bird but darker.

Male, Adult:

Forehead and crown to nape, black, with wide rusty brown tips. A white or buffy line runs down the centre of the crown to the nape where it widens out into the neck hackles; there is also a narrow white sub-marginal line to the crown. Supercilium white or buffy extending from the nostrils over the eye and down the neck band. Loral spot blackish, surmounted by rusty brown or chestnut, which colour extends over the cheeks, side of head, chin, and throat, to the upper breast.

The ear-coverts are dark-brown or blackish. A blackish line starts just posterior to the eye, passes through the ear-coverts and then divides into two, the upper branch extending down the neck, the other encircles the sides of the throat. The centre of the throat is ornamented with a wide anchor-shaped black patch, the arms of which pass upwards in a curve to below the ear-coverts. Sides of breast, back of neck and mantle rufescent brown, each feather with wide sharply pointed shaft-streaks white or buff in colouer, outlined in jet black, in many cases the black being dentate marginally. The hackle-like shaft streaks are wider on the lateral aspect of the mantle and are reduced to streaks centro-dorsally.

The feathers of the scapulars, back, and rump to upper tail-coverts, are black with transverse wide V shaped buff, greyish, or rusty bars; the lateral scapular feathers have wide, sharply pointed shaft-streaks; and similarly coloured feathers ornament the sides of the back, rump, and upper tail-coverts, thus forming a latero-dorsal line on either side. In many examples there is often a second line along the lateral aspect of the rump. Lesser wing-coverts uniform olive-grey-brown with paler tips; coverts similarly coloured but having in addition white shafts and buffy marginal bars. Primaries and secondaries greyish-brown, with rusty bars on the outer webs; the outermost primary and primary coverts with buff margins. Neck band and upper chest rusty or chestnut brown with buffy hackle shaft-streaks; breast more uniform rusty, each feather with a very narrow buff shaft. Sides of chest and flanks buffy with wide buff or whitish shaft lines outlined in black, distally shading into rich chestnut, and decorated with black spots and bars. Rest of underside including under tail-coverts rusty-buff.

Bill grey-brown; legs yellowish-pink; Irish light brown; Wings 100-110 m.m.

FEMALE:

Above very like the male but less rufescent; the cheeks and sides of the neck are buff, while the throat is buffy-white. The side of the head is ornamented with a black line which, starting from the gape, runs below the ear-coverts and down the side of the neck. The feathers of the breast and chest have black margins, giving to these areas a somewhat barred appearance. Flanks as in the male, but not so rufous. Rest of underside dirty buffy-white.

JUVENILE:

Very like the female but striping narrower and barring more distinct; the underside with a mottled appearance, especially on the breast.

HABITS:

In habits the Cape Quail resembles the European bird. It frequents grassy plains and cultivated land more especially shambas which are lying fallow. It is a difficult bird to flush and runs and squats rather than take flight; when it does get up, it flies with rapid wing beats, glides, then drops suddenly into covert; once on the ground it runs, then lies close, so that unless hard-pressed it will not get up a second time. On practically every occasion, the species is met with accidentally; or perhaps one may follow up a calling bird, if the latter then the chances are that it will not be located, for the call is certainly one of the most annoying things I know of. The bird is an adept at moderating the pitch of its voice and its carrying power, also its direction, so that the call seems to come from first here then from the opposite direction; in other words it is a first-class ventriloquist. The actual call is very like that of its European cousin, but is perhaps more metallic, less limpid.

Of local migration there is a certain amount of evidence, but the bird is so scarce that the data is meagre and insufficient.

This Quail breeds in both Kenya and Uganda; the main season, based on the appearance of sexually active birds, appears to be between December and January to March, but here also data is lacking. Coveys have been noted in May and July.

The nest is a mere depression in the ground into which a few grasses are added; it may be situated under a tuft of grass or alongside a large stone. Six to nine eggs are laid, varying somewhat in ground colour from buff to stone-grey, blotched with blackish or deep olive-brown. Some eggs are very sparingly marked while others are a mass of blotches. They measure roughly 30 x 22-24 mm. In shape they are a pointed oval. Seeds and insects are the staple diet, though they also feed largely on greens.

Coturnix delegorguei, Deleg. Harlequin or Black-breasted Quail.
Ref. Deleg. Voy. Afr., Aust., 1847.
Type locality, Upper Limpopo River.

Distribution: Throughout Kenya and Uganda; Resident, and migratory.

Description: Male Adult.

Crown to nape black with slight brownish tips; an ochreous central line extending from the forehead to the neck-bank. Forehead narrowly white and continuous with a white superciliary stripe which extends back into the neck. Crown with very narrow sub-marginal white line. Lores white except for a black spot in front and above the eye. Ear-coverts brownish-black. Chin, cheeks and throat white, divided by a wedge-shaped black throat-patch with lateral basal arms which extend upwards to the ear-coverts; a further black line joins the extremity of this arm to the gape. The white throat is distally bordered by black. Back of neck and mantle brownish, each feather with lance-shaped central white streak bordered with black, those on the latter area with narrow stripe and lateral buff bars. Sides of neck and breast rufescent chestnut with narrow white shafts, black bordered; centre of chest, breast, and lower flank feathers jet black; other flank feathers rich rufescent-chestnut, with black shaft-stripes, widest at extremity.

Abdomen and vent, and under tail-coverts pale chestnut; in some specimens the belly is buffy with blackish bars. Scapulars, back and rump and upper tail-coverts greyish-brown, with narrow wavy cross-bars of buff, outlined in black and brown, those of the rump having wide black bars. The scapular feathers have white shaft streaks outlined in black, while the dorso-lateral feathers of the rump have conspicuous buff streaks accentuated by black outlines. The lateral series of rump feathers also have narrow buff shaft streaks.

Wing-coverts and lesser coverts grey-brown, with buffy or greyish wavy cross-bars outlined in black. Primaries uniform grey-brown; secondaries the same but barred, mostly on the outer web, with greyish-buff. Rectrices blackish-brown with wavy buffy bars.

Bill black; Feet and legs pink or brownish-flesh; Iris brown. Wings 87-95 mm.

Female:

Above similar to the male; throat buffy white demarcated distally and separated from the chest by a series of black-barred feathers; a few black-tipped feathers below the eye and down the side of the neck. Chest and side of breast, greyish-buff or rufous with pale tips and buff shafts; breast and flanks rich rufescent buff, the latter with paler shaft streaks and irregular blackish bars; centre of belly pale

buff. There is a considerable degree of variation in the colour of the females, especially on the lower surface. Very rarely a female may assume male coloration.

JUVENILE:

Very like the female, but stripes narrower; barring coarser; under surface somewhat spotted; flanks more spotted than streaked. Bill horn-brown.

YOUNG IN DOWN:

Crown rufescent buff with two central parallel black lines reaching to the nape and joining the centro-dorsal streak of the back; a dorso-lateral patch of black on the hind quarters; under side rich buff, paler on the throat and belly, these being yellowish. Length 50 mm.

HABITS:

This bird has a wide distribution and is found from the coast, inland, reaching to 8,000 feet. It is decidedly more common in Kenya than Uganda. Many birds are undoubtedly resident, but their numbers are annually augmented by thousands which migrate to these parts either to breed, or on passage. Dates of arrival and departure are not consistent year after year, so it is impossible to give a definite migratory or " Quail season." Weather conditions must have an apreciable effect, for undoubtedly the nesting season is affected thereby. It would appear however that the local birds become most evident just before the breeding season, when they start calling, and after the broods are on the wing. The nesting season according to dates recorded, either of clutches found or breeding birds shot, would appear to be April to July; November to January.

My records shew that Quail were passing over Nairobi in large flocks in March and April, 1919, dozens meeting their death or being maimed by coming into contact with the telephone wires at the Exchange. Again, there is a similar entry for October 20. Regarding other parts of Kenya, the following may be noted as indicating " numbers or large coveys ": Athi Plains, September; Kapiti, September and October; Simba, April and July; Serengeti, September; Kisumu, July. It is thus difficult to decide on a definite " Quail season."

The Harlequin is the common species of the two territories, and is unmistakable both as regards its coloration and its call. Unless breeding, they are usually found in coveys of half a dozen or more, but they get up in ones or twos, though several coveys may occupy quite a small area. The type of country frequented is the open grass plains and hillsides where native cultivations have been allowed to lie fallow. They make their presence known by the call of the male

which is an oft repeated sharp whistling " huit-whit," the last syllable higher than the first and shorter.

Morning and evening are the principal times at which the males call, but on several occasions I have heard them call the whole day long when it has been dull and working up for rain. The female has a low call like " tuit " which is uttered in answer to the male, or when feeding. This same note is uttered by the male and appears to be used as a signal of threatened danger; it is then sharper and louder. As the breeding season approaches the males are persistent in their calls and become exceedingly pugnacious and fight with one another; they do some surprisingly high jumps when trying to avoid one another. If one bird gets a grip of his opponent he jumps about, shakes and worries his foe as a dog worries a rat! I have often watched these battles take place in the wild and so engrossed have the birds been in their mutual hate that I have been able to secure both by putting a butterfly net over them.

These Quail lay quite large eggs, measuring 26-30 x 20-25 mm. of a varying ground colour, either bluish, dirty white to cream, or greyish, almost uniform or heavily marked with fine blackish-brown spots or heavily blotched with purply-brown and blackish. Incubation lasts 14 to 16 days. The clutch may consist of six to ten eggs. These Quail make very interesting Aviary birds and tame readily. They breed well in captivity if the pairs are kept separate and are in a large run. The following record is of interest: a pair were put into an aviary with insectivorous birds; they commenced to nest in December and by January 3rd the clutch of ten eggs was laid. A day or two after, much to my surprise the hen started to lay again, and deposited another clutch on the top of the first one. She made no attempt to brood and after a break of four days she started to lay a further clutch. This went on with varying breaks until the 16th of August, when she became ill and died; the cause of death being the impaction of two fully shelled eggs in the oviduct! The total eggs laid were 122. Had she not become " egg bound " there is no saying how many more eggs she would have laid.

The courting of the female is interesting; the cock starts calling, his whole body held in an upright position; after a few moments he resumes the usual pose, then brings his breast close to the ground and shakes his body from side to side, the while uttering a low " tuit-tuit " note. The female meanwhile goes on eating or preening as though nothing were going on around her. The male then calls again and sidles up to the hen and when almost up to her he bobs his head up and down rapidly, with the neck bent to one side; he then picks up a bit of grass or a stone and throws it over his back. This action appears to arouse her and she submits, after which both birds pick up grass and toss it over their backs.

In the wild state the food consists principally of seeds and insects; they are very partial to white ants.

When the grass is damp the birds are loth to get up; one can almost tread on them before they will take wing. I have on occasions actually caught a squatting bird by hand. If the birds are lying close it is no uncommon thing for a badly trained dog to creep up to a " sitter " and capture it as it squats. I once possessed a rascal of a half pointer-retriever who, when the Quail were in, would go off by himself and come back with two or three birds which he had smelt out and pounced upon; he never ate them himself. Apart from domestic enemies, the Harlequin suffers from the depredations of ground vermin, such as the Wild Cat, Mongoose, Serval, and Jackal, and is frequently taken by Falcons and other predaceous birds.

In certain localities these Quail nest in regular colonies, thus on the Juba and parts of the Frontier as well as on the Serengeti dozens of nests were located in the short grass in quite a small area.

Certain tribes in Kenya are partial to Quail as an item of diet, and taking advantage of the periodic migrations, have become expert trappers and snarers. Pre-eminent amongst these are the Kavirondo. True it is that only certain families in certain villages are the professional trappers, but these are such experts that the method they adopt is deadly in its effect, and is responsible for the diminution of the Quail to quite an appreciable extent. The method depends on the susceptibility of the species to respond to the call of a decoy; the decoy in this instance being captive birds which are kept for the purpose. Each bird is kept separate in a small wicker or reed-work basket with a handle at the top; these baskets are strung on a long rope and fastened to the end of a long pole.* The number of decoys used varies and depends on the abundance or paucity of wild birds, the more the less. A suitable site is chosen, usually one where the bush is stunted and the grass only moderately long; in the centre of the patch the decoy pole is placed, and paths are roughly cut in radiating fashion from this point; branches of thorn or bits of stick are placed as barriers at intervals of four to five feet, leaving just sufficient opening for a bird to pass; the grass alongside the barrier is twisted up to form an arch and from this the deadly noose of fibre is suspended. The snares may be in series of two or three circles of varying diameters. The wiley native has learnt that a travelling quail will rather use a run than force its way through thick grass, thus the deluded bird following up the call of the decoy approaches along the runs and is caught. Some of the victims become strangled, others survive until the periodical visits of the snare owner; the survivors are not killed outright, but are taken from the snare, the legs and wings are broken and the helpless victims are cast into a basket. Such birds go to the villages, but if birds are destined for

* *See frontispiece.*

the township market they are spared the bone-breaking and are packed into baskets, sometimes a dozen in a basket hardly more than a foot in diameter. Such practices exist to-day, but owing to the influence of officials, more humane treatment is the rule. It is to be hoped that the new Game Bird Protection Act will be so administered as to put a stop to the wholesale capture of Quail in Kavirondo and Maragoli. Such stoppage will inflict no hardship on the natives. The decoys are well fed, being given a lavish diet of seeds, Whimbi and Mtama, and fresh insects in the form of live white ants; they are also regularly watered. The life of a decoy is anything up to five years.

The call of the Harlequin is easy to imitate, so much so that I have not infrequently been able to call up wild birds to within a couple of yards of where I have been concealed.

Genus **EXCALFACTORIA, Bp.**

Excalfactoria adansoni, Verr. Blue Quail.
Ref. Verr. Red. Mag. Z., 1851.
Type locality, South Africa.
Distribution: Suitable localities throughout Kenya and Uganda.

Description: Male Adult.

Forehead, crown, mantle, back and centre of rump, dark slaty grey-black, the back and rump with black blotches. Scapulars, wing-coverts and sides of rump bright chestnut, with slate-grey shaft streaks; lesser coverts slate blue; primaries and secondaries grey-brown. Chest breast and flanks bluish-slate-grey, the latter with bright chestnut margins. Centre of belly greyish-black. Loral stripe white; a black line extends from the gape, passes below the eye to the lower edge of the ear-coverts, then on to the side of the neck encircling the wide white neck gorget; chin and throat with a jet black triangle, from the basal angles of which run curved lines which join the blackish ear-coverts. Tail dark slate, entirely covered over by the long upper tail-coverts. Eyes crimson; bill, blue-black; legs and feet pinkish-yellow. Wings 75-82 mm.

Female:

Adult. Quite unlike the male. Forehead and crown ochreous brown, the latter with black tips; a central coronal line of white extends to the nape. Lores, supercilium, cheeks lighter ochreous, the last with black spots. Ear-coverts dark brown. Feathers of hind neck, mantle and scapulars, back and rump, ochreous-brown irregularly banded with blackish-brown and with large black blotches towards the tips; most feathers with a narrow white shaft stripe. Throat rufescent buff with black spots and tips. Sides of the chest,

breast and flanks buffy white with brown-black wavy bands. Abdomen and thighs greyish-buff, narrowily banded with greyish-black. Inner secondaries with fine buff vermiculations, outer secondaries and primaries uniform greyish-black. Wing-coverts rufescent buff vermiculated and barred with black.

JUVENILE:

Like the female, but the underside is paler, and the barring is not so distinct. The upper side is more barred and browner; the white shaft stripes are not so pronounced. The nestling chick is unknown to me.

HABITS:

The Blue Quail is by far the daintiest and most beautiful of the quail family in this country; the contrast between the sexes adding to their attractiveness. It is a great pity that the species is not more plentiful. It appears to have a marked preference for localities where the grass is not too long or too dense, and this fact, no doubt, tends towards its undoing—it falls an easy prey to enemies of the air as well as ground vermin. It is undoubtedly a sluggish bird which feeds well and is hard to flush. When once on the wing they go fast but soon drop into cover. Every example that I have handled has been fat!

The species is usually found in pairs or small coveys, made up of a family party. We found them breeding at the coast in October, and in Uganda, Mpumu, in April; while published records give October, November, and June as months in which nests have been recorded. The breeding season is thus rather uncertain. The nest is a shallow depression lined with bits of grass, and situated under a tuft of grass or small herb; the eggs are putty coloured, and six usually form the clutch.

The species is a local migrant, appearing in a given locality for a month or two then moving off, but in what direction and with what object we do not know.

The call note is unknown to me; the only sound I have heard is a whistling note when a cock has been suddenly flushed.

FAMILY.—TURNICIDAE.

GENUS.—**TURNIX, Bonn.**

Turnix sylvatica alleni, Mearns. Common Button Quail.
T.s. lepurana, auct.
Ref. Mearns, S.M. Col., Vol. 56, No. 20, 1911.
Type locality, N. Guasso Nyiro, N.F.D.

Distribution: Kenya and Uganda in suitable localities.

Description: Male Adult.

Feathers of crown blackish-brown, with paler brown tips; a centro-coronal line of buff or white. Supercilium, lores and cheeks, buffy, each feather with blackish marginal tips; chin and throat pale buffy-white, or white. Lower neck rufescent brown with bands and black shaft streaks. Mantle, scapulars, rump, and upper tail-coverts blackish-brown centrally, with wide buffy white margins, greyish tips and irregular wavy barring and vermiculations of rufescent brown. Wing coverts rich rufous buff with wide white border to outer webs, with bold spots and lines separating the lines and bars. Lesser-coverts more greyish. Primaries and secondaries greyish brown edged on the outer web with buff.

Middle of chest rich rusty orange; sides of chest rufous buff, each feather with bold black cordate subterminal spot; lower breast and abdomen whitish buff shading to buff on the flanks; under tail-coverts rusty. Bill, bluish horn; legs pinkish white; iris yellow or cream. Wings 73-76 mm.

Female Adult:

Somewhat like the male but larger and more richly and brightly coloured. Forehead up to mid-line of eyes, supercilium, sides of head, chin and side of neck whitish buff, each feather with black tips, giving these areas a spotted appearance. Throat more uniform buffy white; crown to nape and upper part of mantle rich light chestnut, the feathers of the mantle with greyish margins and tips. A centro-dorsal buffy line down the crown. Pattern of feathers of the upper-side as in the male, as boldly marked but more rufescent. The wing coverts are more boldly marked, while the chest patch is richer orange, more extended reaching to the sides of the breast. Tail long and markedly pointed. Wings 83-88 mm.

Juvenile:

In first feather, crown rufescent with black centres; white central line indicated by a few feathers; supercilium white; under-surface white except for the chest and sides of breast, these are striped with blackish-brown. Feathers on side of chest brownish with large bilateral subterminal white spots. Wing-coverts similarly marked; primaries greyish with buff margins to outer webs; secondaries with buff barring and white spotting. Dorsum of body rufescent brown with fine vermiculations of dark brown, the feathers of the mantle with white marginal spots. Bill and legs whitish pink; eye brown.

Habits:

The Common Button Quail or Hemipod is an inhabitant of the drier more sandy areas of the Colony, where vegetation is short and the bush somewhat sparse; it also frequents old native cultivations. My experience has been that it is most plentiful along the coast,

inland to the Taru and through the Kedong to South Kavirondo; it is equally plentiful along the Northern Guasso Nyiro and Isiola. On Mombasa Island it is almost the only " game bird " left. One sees an occasional *Francolinus sephaena*).

From the sporting point of view the Button Quail is disappointing; they lie remarkably close, so much so that when they rise they get up almost at one's feet, and then they fly only a few yards, drop, and run to cover. Seldom have I been able to flush a bird a second time; but not infrequently if the cover has been poor I have captured the squatting bird with my hand. In thick cover the bird is as good as lost, unless one has a dog; even then, the dog, more often than the gunner, gets the bird. I have known a pointer to creep up and put his nose within an inch of a squatting bird and yet it would not move. The remarkable variegated plumage harmonises well with the surroundings and is very cryptic.

Insects enter largely into the diet of these birds, at certain time almost to the exclusion of seeds.

The species is resident in suitable localities throughout the year, though there is undoubtedly an influx of visitants at certain times; thus at Kisumu, during July, several birds were flushed in an old native Whimbi field—they were not there the previous week.

As will be seen from the wing measurements and the descriptions the female is not only larger than the male but handsomer, and in conjunction with this it is interesting to note that the female does practically no incubating of the eggs nor does she look after the young, leaving these duties to the male. We have found several nests and invariably, if a bird has been put off it has been the male. The nest is situated in a tuft of grass or beneath some stunted vegetation, and consists of a shallow depression lined with grass. The clutch consists of three to four eggs, pyriform in shape and ashy-grey-green in ground colour, spotted with reddish or purply brown mostly towards the larger end. They measure 22 x 18 mm. We have not seen a newly hatched chick but they are described as very quaint and no bigger than a large bumble Bee (Horsburgh).

The call note of the Button Quail is curious, being a full whistling " oo-up," the last note short.

Turnix nana, Sundv. Rufous faced Button Quail.
Ref. Sundeval, Oef. Vet. Akad. forhand., 1850.
Type locality, Natal.
Distribution: So far only in Uganda.

Description: Male Adult.

Crown of head to nape rufescent brown, each feather with white margins. Forehead, lores, supercilium, cheeks, and fore neck, orange-

tawny or rufous, which colour extends over the chest. Throat white or buff. Sides of chest rufescent brown with darker bars and white tips. Mantle and scapulars rufescent to chestnut, each feather with wavy bars and marked white margins, those along the edge of the scapulars with ochreous buff margins; back and rump darker brown; upper tail-coverts brownish with darker centres. Wing-coverts pale chestnut with wavy brownish bars and ochreous buff edges; lesser coverts greyer. Flanks and belly white; under tail-coverts rufous-buff.

Female:
Like the male but larger, with coloration rather brighter.

Juvenile:
Very like the young of *alleni*, but more rufous above and on the chest, the latter barred and striped with dark brown.

Habits:
The Rufous-faced Button Quail does not to our knowledge occur in Kenya and its appearance in Uganda is rather remarkable. It is a species more confined to Natal and Nyassaland.

It is certainly not common, though on account of its retiring habits it has been overlooked. It frequents country where the vegetation is poor and the soil sandy and dry. It does not take wing readily and will seldom rise until one is on top of it. Its flight is straight but weak. It appears to be resident, and has been found breeding in July, October, and November. The nest is similar to that of the Common Button Quail. The eggs have a pale greenish ground heavily spotted with dark brown; there are four in the clutch.

In general habits this species resembles the " common " one and the call is somewhat similar, differing only in its lower pitch and more like " hoo-p."

Genus **ORTYXELOS, Vieill.**

Ortyxelos meiffreni, Vieill. Quail-Plover.
Ref. Vieill. N. Dict. H.N., XXXV., 1818.
Type locality, Senegal.
Distribution: North Kenya and Uganda.

Description: Male Adult:
Crown of head brown with a buffy-white median line; supercilium and sides of head creamy; a brownish streak extends from the ear-coverts down the upper neck; mantle scapulars and back, pale red-brown, each feather with buffy or white edges, internally banded with black, body of feathers vermiculated with blackish. Rump more

uniform red-brown with black barring. Inner wing-coverts similar to scapulars, but with wider white; outer primaries buff at base and tips; inner primaries and secondaries, blackish with white ends; throat and undersurface, buffy white, darker on the chest, especially on the sides which may be rufous, barred with irregular wavy black lines and white-spotted. Wings 75-80. Eyes light brown; feet and legs yellowish white.

FEMALE:

Very like the male.

HABITS:

The Quail Plover frequents the dry sandy country where the vegetation is stunted and coarse. In such localities it can survive without coming to free water, obtaining sufficient moisture from its food. It keeps to the more open ground and may there be seen running about, but if disturbed it crouches, and if flushed it flies but a short distance, drops, runs a little way and crouches again, if still threatened. We have watched a bird run and crouch, and having marked the spot, as we thought, walked up to it, but no bird could be found until a glint of an eye attracted our attention to a slight hollow; there was the bird squatting tight, its colour remarkably like its immediate surroundings.

When moving on the ground this bird is very Courser-like; in fact we mistook it at first for a young courser, and it was not until we handled the shot specimen that its identity was revealed.

We have no personal knowledge of the nesting habits but Admiral Lynes describes the nest as a shallow depression in firm sand, near the foot of a bush, lined with a few leaves and stalks; the eggs, two in number, " oblate-oval " in shape, with slight gloss; ground colour stone with inky purple deep marks and surface blotches and spots of black. Size 17 x 14.

Breeding birds were collected in December and January, but beyond this we do not know the breeding seasons.

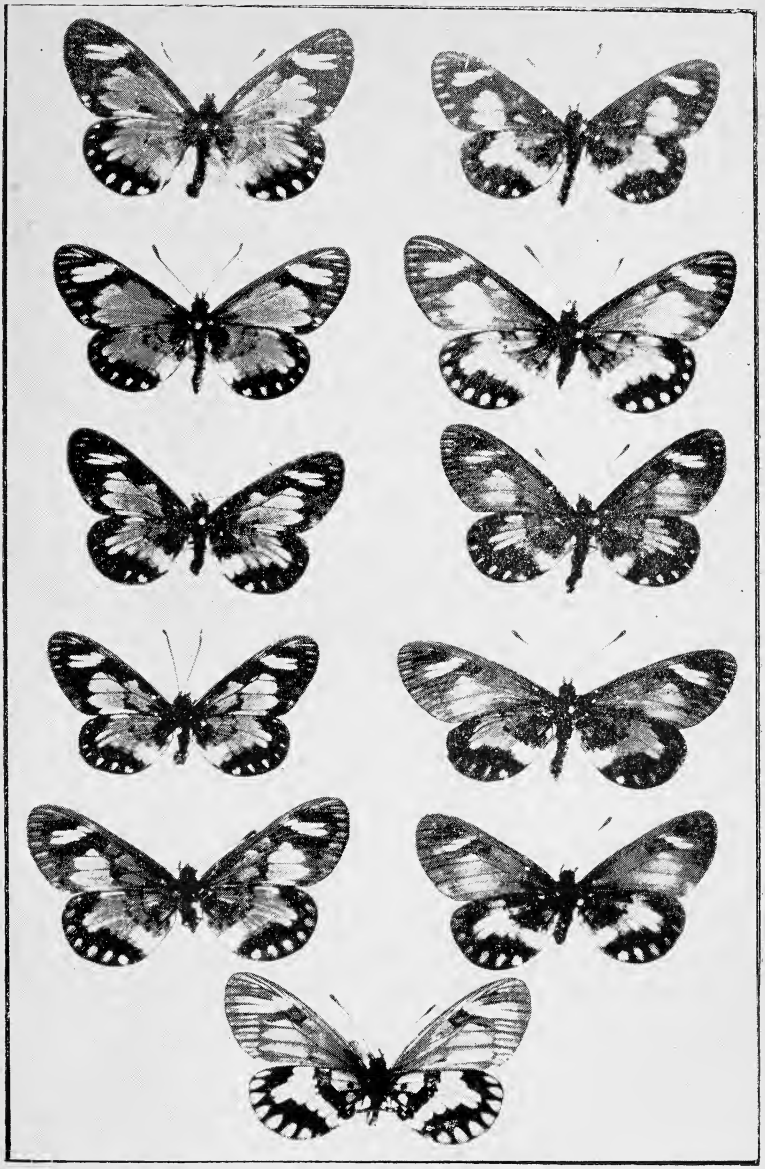

Photo: V. G. L. van Someren.

PL. XVI.

Figs. 1—4. Acræa rangatana (Males). Figs. 5—10. Acræa rangatana (Females).

Fig. 11. Acræa rangatana, under surface.

THE BUTTERFLIES OF KENYA AND UGANDA.

Part IV.

Sub-Family *ACRÆINÆ*.
Genus *ACRÆA*.

66. ACRÆA RANGATANA (continued). Plate XVI., figs. 1-11.

Since writing Part III. of this series we have obtained this species in very large numbers from Kinangop. There is little to add to the description of the male. There is a certain amount of variation in the depth of the orange ground colour; in the size and distinctness of the sub-marginal spots in both wings, and in the amount of black along the costa and upper half of the cell of the fore-wing. There is very frequently a black spot about half way along the lower edge of cellule 1b, and this is, in some specimens, carried up as a streak to join the base of area 2.

The female is somewhat more variable; the predominant form appears to be somewhat like the male but with less intense though wider black marks, especially in the region of the cell of the fore-wing, thus almost entirely obliterating the orange in this area. The sub-apical bar of the fore-wing is reduced, while the basal suffusion on the hind-wing is increased. The second commonest form is one in which the pale areas of both wings are more ochreous, retaining the orange colour in the upper part of the cell and bases of areas 6 and 7.

A third form has the whole of the fore-wing except for the sub-apical bar and sub-marginal spots, heavily dusted with black, thus giving the wing a smoky apearance. In this form the hind-wing pale areas may be either orange (except at the inner margin) or ochreous.

The under-side varies only in respect to the amount of red scaling both sub-marginally and sub-basally.

Early Stages:

We have bred this species in very large numbers. The eggs are of the usual acræine type, and are laid in groups on the upper or under surfaces of two aquatic weeds (a new species of Nesaea) and *Rotala sp.* (Lythraceæ).

They have a marked preference for the former, which grows right in the water, but if this plant becomes submerged they will lay on the second species. The larvae also have a similar preference. When newly emerged, the larvæ is brownish but at the second moult becomes bluish grey above, brownish olive below, the two colours being separated by a white or ochreous spiracular line, bordered above

by black lines; each spiracle is crimson or red. On the dorsal surface, each segment is anteriorly bordered with black, but divided centrally by a greyish or white line which runs the length of the dorsum. In many examples the lower edge of the black band is accentuated by a white line. The colour of the larvæ is extremely constant. The head is a uniform shiny black. The usual number of spines is present on each segment, all uniform black in colour except those on the spiracular line; these have crimson bases. The spines are very short, not long as in *Acræa terpsichore*.

The pupæ are mainly of two patterns, either uniform black with ochreous or orange spiracular spots on the lateral aspect of the abdominal segments, or black and white. The egg stage varies from 7 to 12 days; the larval period extends to 14 days, and that of the pupa 10 to 18 days.

This *Acræa*, hitherto rare, and known only from two specimens, must be very seasonal. During April, 1926, it simply swarmed along the banks of the Kiteri River on the Kinangop, whereas in August, 1924, and January, 1925, there was not a single example visible; the commonest species then being *A. excelsior*. The flight is slow and weak and the insect keeps low to the ground, and so is easy to capture.

Distribution:

The known distribution of this insect is the high plateau of the Kinangop and Aberdares to Laikipia, and along the Mau to Lumbwa.

67. ACRÆA ALTHOFFI. Dewitz. Plate XVII., figs. 1—4. Plate XVIII., figs. 5—7.

Expanse 58-65 mm. General colour black and red with a white bar on the hind-wing. The male of this species is fairly constant and may be described as follows: F.-w. brownish black; basal two-thirds of lower half of cell orange red or scarlet gradually widening towards the distal end, where it becomes bulbous, and carried up as streak across the cell to below the costa. Just beyond the end of the cell is a black spot distally bounded by a somewhat rectangular red bar, basal in 4, 5, and 6. Below and external to this is a quadrate red spot in 3, contiguous with the red in 4. A large red spot is present sub-basally in 2, accentuated somewhat by the triangular black base. The red continues down through areas 1b and 1a; in the former it is deeply indented proximally. H.-w. brownish black, with a pale creamy white bar traversing the wing from about centre of costa to middle of 1a at inner margin. The triangular black at the base has a series of darker spots which correspond to those of the underside.

Underside: F.-w. costa and apex and outer margin ochreous brown, the latter two with black rays and white internervular streaks outlined in black. Sub-apical bar ochreous inclining to dull red

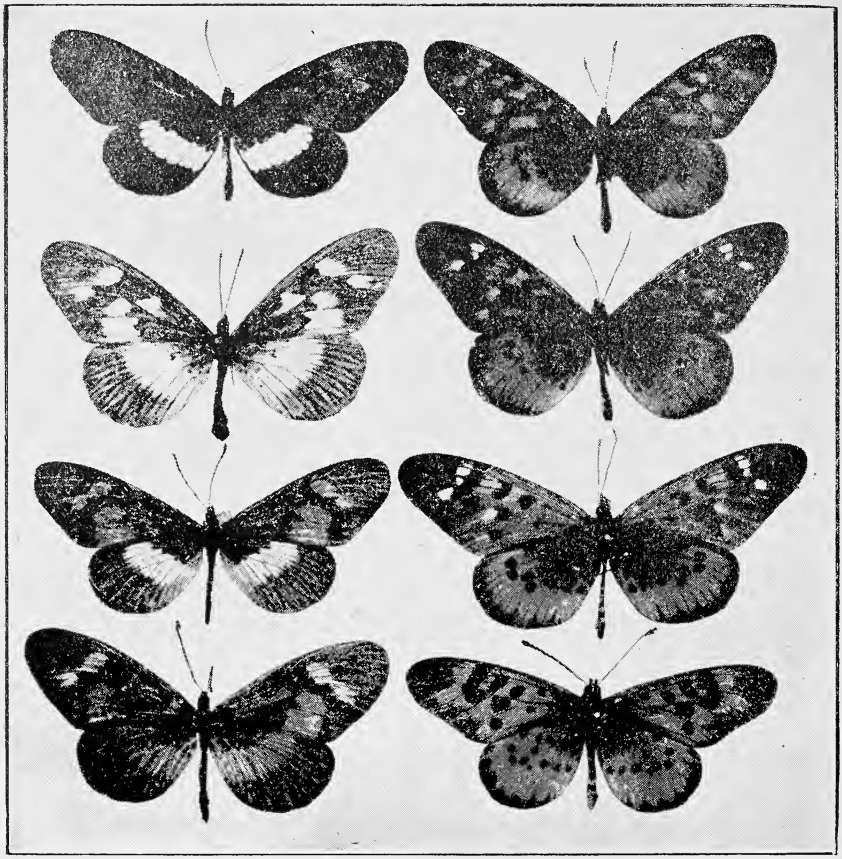

Photo: V. G. L. van Someren.

PL. XVII.

Fig. 1. Acræa althoffi althoffi (Male).
Fig. 2. Acræa althoffi althoffi. (Female.)
Fig. 3. Acræa althoffi f. drucei.
Fig. 4. Acræa althoffi f. ochreata.
Fig. 5. Acræa pharsalus pharsalus (Male.)
Fig. 6. Acræa pharsalus pharsalus.
Fig. 7. Acræa pharsalus pharsalus. (Female.)
Fig. 8. Acræa pharsalus f. pharsaloides.

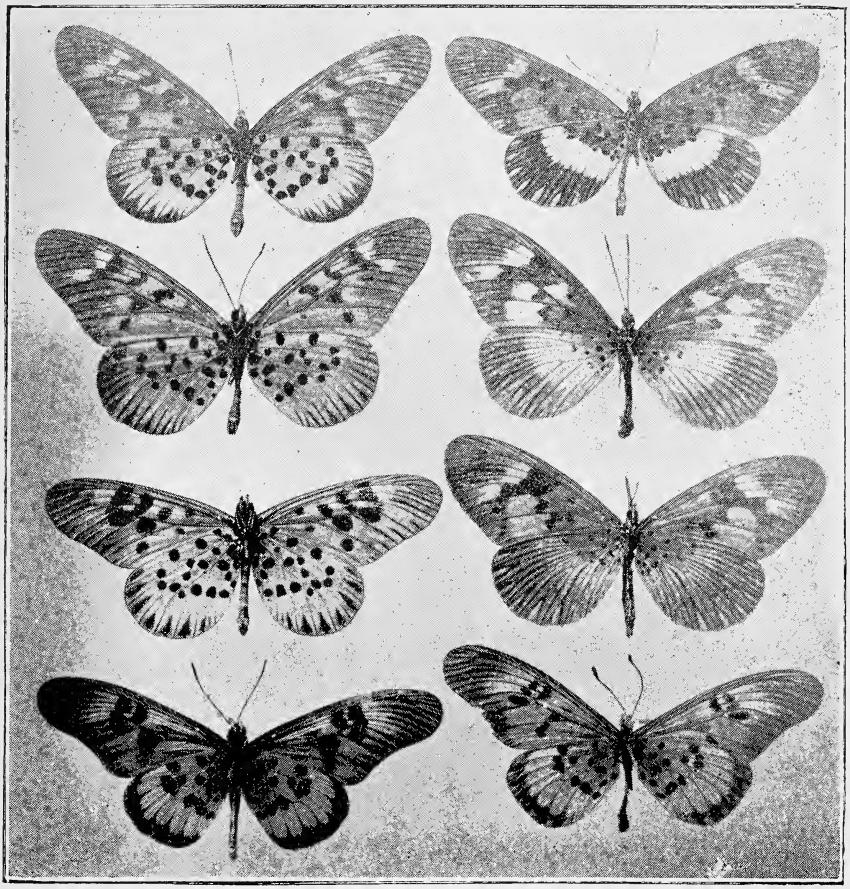

Photo: V. G. L. van Someren.

PL. XVIII.

Under surfaces.

Fig. 1. Acræa pharsalus pharsalus.
Fig. 2. Acræa pharsalus pharsalus.
Fig. 3. Acræa pharsalus f. pharsaloides.
Fig. 4. Acræa parenna parenna.
Fig. 5. Acræa althoffi althoffi.
Fig. 6. Acræa althoffi althoffi. (Female.)
Fig. 7. Acræa althoffi f. ochreata.
Fig. 8. Acræa perenna thesprio.

proximally, cell and areas 1b and 2 corresponding to red marks above dull red. Cell with a central round black spot, external to which is a transverse black line towards the end of cell. Beyond the apex of the cell and the sub-apical bar is an oblique black bar connected by a streak to the transverse line in the cell. There are two black spots in 1b; one indenting the red area proximally, the other internal to origin of vein 2. A sub-basal black spot is present in 2.

H.-w.: Base greenish ochreous, followed by a creamy bar, corresponding to patch on upper side, beyond which the wing is brownish with black veins and internervular rays, the latter splitting distally to enclose white or cream streaks.

Base of wing, internal to the cream bar, spotted as follows: One each in 8 and 9; two in 7; one each at bases of 6 and 5; two mid-way in cell; three in 1c. towards the base; three in 1b; and one minute spot in 1a.

Female:

The female is variable, but the typical form is:

(a) Black and white. The pattern is similar to that of the male but the pale areas are larger and the black is not so heavy. The streak in the cell stops short of the base.

(b) Is somewhat similar to the male in the fore-wings except that the red areas are duller and larger. The hind-wing bar is more ochreous and the distal half of the wing is more ochreous brown so that the black rays and veins show up distinctly.
Pl. XVII., fig. 3. =*f. drucei.*

(c) Is very like (b) except that all the areas are tawny brown with the sub-apical bar ochreous.
Pl. XVII., fig. 4. = *f. ochreata.*

(d) The fourth form occurs in Uganda; this had all the pale markings an orange ochreous, with an extension of this colour over the base of the fore-wing and over the whole of the hind-wing. =*f. telloides.*

68. Professor Poulton has described a race as *A. althoffi neavei*, which differs from the typical form in having the pale bar of the hind-wing dull orange and the fore-wing marks a darker orange. This race occurs in Western Uganda at Toro.

Early Stages:

Unknown to us, nor is there any published record.

Distribution:

The species occurs throughout Uganda, East to Elgon and Kakamega Forest. The female is very variable, and undoubtedly mimetic in its various forms; thus the black and white form mimics

the female of *Planema macarista* and *Pl. alcinoe camaruinca;* the orange brown *telloides* mimics the *dorotheæ* form of *Acræa jodutta* and *Pl. tellus eumelis;* while the rare *neavei* is mimetic of *Pl. pseudeuryta.*

69. ACRÆA PHARSALUS PHARSALUS. Ward. Plate XVII., figs. 5—7. Plate XVIII., figs. 1—2.

Expanse 60-75 mm. General colour red with black spots.

F.-w.: costa and margin brownish black, with a variable degree of blackish suffusion at the base of the wing and nearly the whole of area 1a. Sub-apical bar consisting of three somewhat quadrate spots either white dusted with red or bright red. Distal half of cell, bases of areas 6-2 and almost the whole of 1b bright red, which colour extends to the distal end of 1a, but stops short of the margin. These red areas are accentuated by the presence of black spots as follows: Cell with three spots, one small sub-basally, one large central, and one transverse at apex; internal to the sub-apical bar is a series of four rectangular spots, the fourth in 3 set slightly in from the next; a triangular spot towards base of 2; two in 1b, sub-basal and sub-marginal.

H.-w. mostly red with a slight black suffusion at the base and a narrow black marginal border 2-2½ mm. wide, indented on the inner edge. Distinct heavy black spots correspond to those on the underside.

Underside: F.-w. areas corresponding to the red marks of the upper side are all pinkish ochreous. Black spots as above with in addition one at base of costa; rest of wing greyish brown with black veins and inter-nervular rays.

H.-w. pinkish, shading to greenish grey at base; margin with black internervular rays; extreme edge black bordered internally with greenish grey. Spots as follows: One each in 8 and 9; two in 7, sub-basal and mid-way; one slightly internal to mid-point in 6; two in 5, basal and central; two in 4, basal and sub-basal; one each sub-basal in 3 and 2; three in 1c, basal, sub-basal, and mid-way; two each in 1b and 1a.

Female:

Very like the male but larger and duller.

Early Stages:

The species has not been bred through by us, but the larva is ochreous yellow above, slightly paler below, margins of each segment darker; a central dorsal line extends the length of the body; the basal branches are pale ochre while the rest are black. The head is black with a white line in centre. The pupa is white, with black lines and dots which vary in width so that the appearance is either white or blackish.

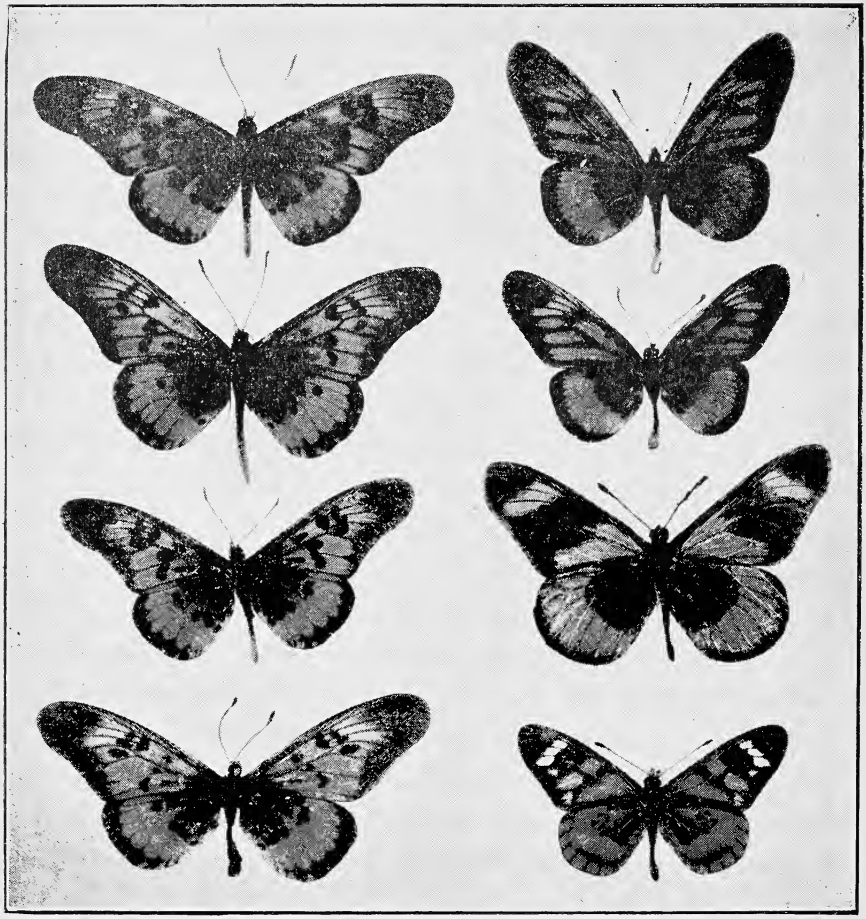

Photo: V. G. L. van Someren.

PL. XIX.

Fig. 1. Acræa parenna parenna.
Fig. 2. Acræa parenna parenna.
Fig. 3. Acræa parenna thesprio.
Fig. 4. Acræa parenna thesprio. (Female.)
Fig. 5. Acræa orina orineta.
Fig. 6. Acræa orina orineta.
Fig. 7. Acræa baxteri subsquamia.
Fig. 8. Acræa amicitiæ. (Male.)

The form *pharsaloides* is common and occurs along with the typical one, but is more plentiful towards the east. It differs from the typical form in having less black at the bases and margins of the fore and hind-wings, and in having large internervular spots on the hind-wings underside. (Pl. XVII., fig. 8. Pl. XVIII., fig. 3.)

Distribution:

The more typical forms range through Uganda east to Elgon and Nandi, where they tend towards the *pharsalloides* form, this latter variety being met with through to Mount Kenya and again at Teita. Though common in Uganda it is a comparatively rare species in South Kenya.

70. ACRÆA PERENNA PERENNA. Doubl. Plate XIX., figs. 1 and 2. Pl. XVIII., fig. 4.

Expanse 50-75 mm. General colour black and red, with narrow forewings markedly concave at outer margin.

F.-w. sepia black at base, costa, apex, and margin; somewhat translucent blackish in the region of the bases of 3, 4, 5, and 6 and distal end of cell; the distal portion of 1a, nearly the whole (except extremities) of 1b, and the base of 2, are bright red. There is also a slight reddish mark at distal end of cell. In some specimens there is evidence of reddish sub-marginal spots especially in 1b. Black spots as follows: One just beyond centre of cell, followed by a larger one at the end of it; a row of distal spots in 6 to 3, the last set slightly in from the rest; a circular spot in 2 almost enclosing the base, and below this a crescentic spot in 1b, internal to which is a black streak reaching to the base.

H.-w. mostly bright red with a blackish base through which the black spots show. Margin black, indented on inner edge and ornamented with red internervular dots, duplicated in 1c. Black spots as below.

Underside: F.-w. apex and margins rusty ochreous with black rays and veins. Central part of wing greyish black and red areas as above, but dull; cell and base of 1b, vitreous.

H.-w. reddish at base; central area greenish grey merging to pinkish grey over the rest of the wing.

Margin black and spotted with red as above, the black entering somewhat up the veins. Black spots as follows: One in 8; two in 7, sub-basal and central; one basal in 6; two in 5, basal and sub-basal; one basal in 4; one basal in 2; two each in 1c and 1b, sub-basal and about mid-point; one in 1a; cell with two, one basal and one above origin vein 2.

Female:

Larger and duller than the male but otherwise somewhat similar.

Early Stages:

The eggs are of the usual acræine form, yellow in colour, and laid in groups on *Adenia cissampeloides*, Harms *(Passifloraceæ)*.

The larvæ are, at all stages, blackish brown. The mature larva has a series of elongate ochreous dots which form a broken body line. Behind each lateral spine is a small yellowish dot, but the number of these dots is variable. There is, on occasion, a yellowish, broken, centro-dorsal line.

The body spines are long and black. The head is uniform shiny black. The pupa is white or ochreous, with very fine lines on the wing cases and thorax, while the abdominal segments are ornamented with the usual streaks and ochreous dots to the lateral surface.

Distribution:

The typical race of *perenna* extends through Uganda from Toro to Elgon and south to Lumbwa and Sotik. Eltringham has recorded it from Nairobi (Harrison Coll.), but this locality is doubtful.

71. ACRÆA PERENNA THESPRIO. Pl. XIX., figs. 3 and 4. Pl. XVIII., fig. 8.

This race differs from the typical form in having the red area greatly increased at the expense of the black. The distribution of black spots remains constant.

Early Stages:

The larvæ of this race appear to differ from the typical only in regard to the underside of the body, this area being ochreous to brownish.

Distribution:

This eastern race is not common, but has been taken along the coast at Rabai and Sokoke and inland at Teita.

72. ACRÆA ORINA ORINETA. Eltr. Pl. XIX., figs. 5 and 6. Pl. XXII., figs. 1.

Expanse 50-65 mm. General colour black and red.

F.-w. brownish black at costa, apex (5 mm.) and margin, and apex of cell; rest of wing bright red, this red area being divided up by heavy blackish scaling along the veins, giving prominence to the veination.

H.-w. mostly red, with a black marginal border 1-5 mm. wide and a triangular black basal area ornamented with more intense black spots; spots as below.

Underside:

F.-w. red areas as above but duller; costa, apex, and margin ochreous with black veins and internervular rays. There are blackish streaks in 1b and cell.

H.-w. basal area and an extension along the costa greenish, followed by an ochreous pink area bordered distally by a greenish margin; veins and internervular rays black; black spots as follows: One each in 8 and 9; two large in 7; one at base of 6 and 5; one in 4; one basal in 2; three in 1b, basal, sub-basal, and central; one elongate spot each in 1b and 1a.

Female:

Like the male but duller or with the discal spots whitish. The form *nigroapicalis*, Auriv, is ilke the typical form, but the discal red marks of the fore-wing are wanting, this place being occupied by black.

Early Stages:

Unknown.

Distribution:

The *f. nigroapicalis* is met with in Uganda east to Entebbe and Jinja, but it occurs with the race *orineta;* we have not taken this species east or north of Busoga.

73. ACRÆA BAXTERI. Sharpe. Pl. XIX., figs. 7. Pl. XXII., fig. 2.

Expanse 60-65 mm. General colour black and red.

F.-w. basal half of cell, base of 2 and basal two-thirds of 1b red; rest of wing thinly scaled black except in the region of sub-apical bar where the scaling is so thin as to form a transparent bar.

H.-w. base, to as far as apex of cell, black, broken by an area of red in upper part of cell and areas 7 to 4; rest of wing dull red, except at marginal border which is blackish, the black entering up the veins and so giving an undulating inner edge to the border. Basal black spots indistinct except in the red area.

Underside:

Both wings almost scaleless but fore-wing red areas show through from above as dull patches. Hind-wing basal area brown, slightly redder at base of 6; rest of wing pinkish merging to reddish at the border; this marginal border broken up by blackish triangles at the distal end of veins. Black marks as follows: One in 8, two in transverse in 7; one each at base of 6 and 4; two in 5 and 4, one basal, one sub-basal; one sub-basal in 3; three in 1c, basal ,sub-basal, and central; two each in 1b and 1a.

The above description would agree best with the form *subsquamia*, Thurau.

Early Stages:

Unknown.

DISTRIBUTION:

The species to our knowledge occurs on the high plateau of Aberdares and Escarpment and again in the Teita Sagalla area, but it is nowhere common and may in fact be considered a rare insect.

74. *ACRÆA PENELEOS PELASGIUS*, Eltr. Pl. XX., figs. 1 and 2 and 4.

Expanse 45 to 60 mm. General colour black with red hind-wings.

F.-w. sepia black along costa, apex and outer margin. Base of wing including cell and basal part of 1b and 2 very thinly scaled and transparent blackish.

Bases of 6 to 3 almost entirely devoid of scales and thus transparent. Sub-basal in 2 and distal in 1b, orange red spots thinly scaled; below these a red streak in 1a.

H.-w. with a triangular black base bearing black spots; marginal border 2 to 3 mm. wide, black, intervening area orange red.

UNDERSIDE:

F.-w.: Portions corresponding to the semi-transparent areas of above almost devoid of scales and vitreous; apex and margin ochreous brown with black brown veins and rays.

H.-w.: Basal area rusty brown, brighter distally; marginal border umber brown shading to rusty brown proximally; intervening bright area ochre yellow, divided by brown nervular streaks. Black spots all large (except those in 5 and 6) as follows: One in 8, two in 7, sub-basal and central two each in 5 and 6, basal and sub-basal; one at base of 2; three in 1c, basal, sub-basal, and central; two in 1b and 1a.

FEMALE:

F.-w. brownish, thinly scaled; transparent spots gradually increasing in size in 6 to 4 followed by dull reddish spots in mid 2, 1b, and 1a. H.-w. mostly dull rusty red, slightly paler at marginal border; marginal border brownish with short nervular and inter-nervular rays; basal area with slight brownish suffusion to about mid-cell. Black spots as in male.

UNDERSIDE:

F.-w. as above but more ochreous at costa, apex and margin.

H.-w. basal area as in male, but ochreous bar narrower than in male, and accentuated by a wide marginal border of light brown. Has not been bred by us, but Eltringham describes the larva as " ground colour dark brown with transverse striae of a darker tint, bordered with yellow. Lateral line and legs yellow; head bright chestnut; spines black. Pupa not described.

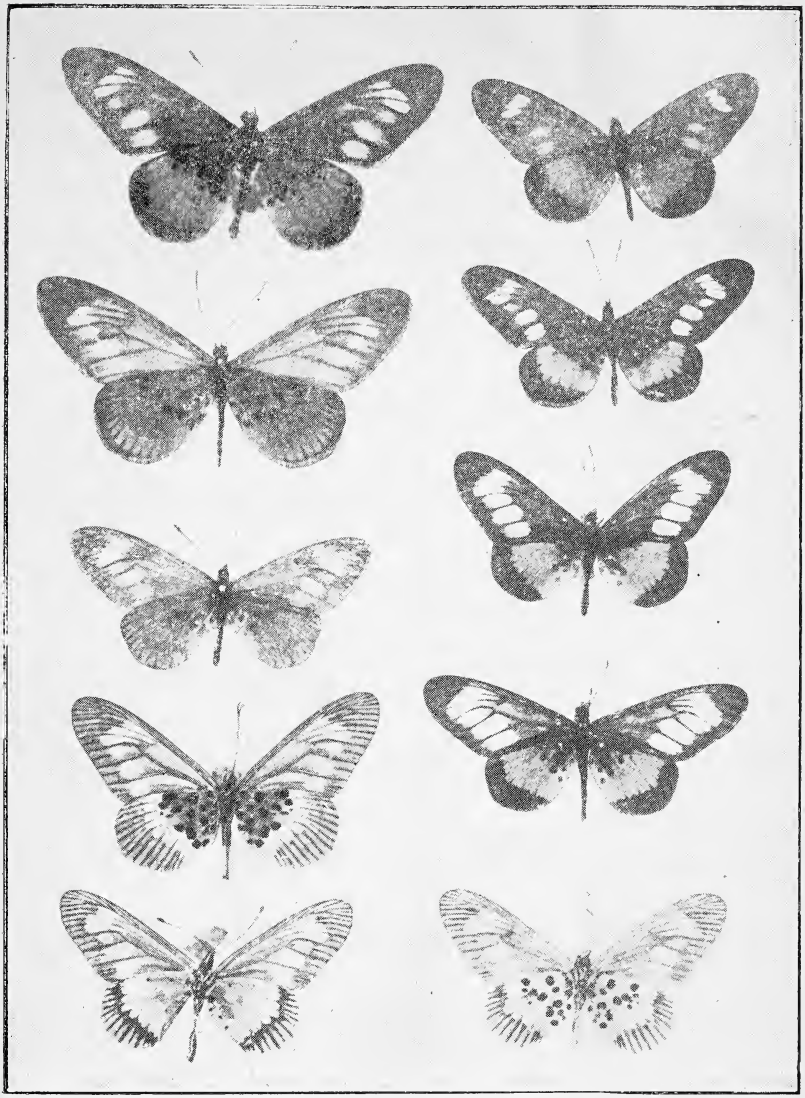

Photo: V. G. L. van Someren.

PL. XX.

Fig. 1. Acræa peneleos pelasgius. (Male.)
Fig. 2. Acræa peneleos pelasgius. (Female.)
Fig. 3. Acræa penelope penella. (Female.)
Fig. 4. Acræa peneleos pelasgius, underside.
Fig. 5. Acræa penelope, underside, var.
Fig. 6. Acræa penelope penelope. (Male.)
Fig. 7. Acræa penelope penelope. (Male.)
Fig. 8. Acræa penelope vitrea. (Male.)
Fig. 9. Acræa penelope vitrea. (Female.)
Fig. 10. Acræa penelope penelope, underside.

DISTRIBUTION:

Uganda from west to east and occasionally in Kavirondo.

75. ACRÆA PENELOPE. Staud. Pl. XX., figs. 6 and 7 and 10.

Expanse 40-50 mm. General colour black and red.

F.-w. generally black except for a series of three transparent elongate spots beyond the cell in sub-apical region. Below and internal to these in areas 3, 2 and 1b (and occasionally in 1a) in gradually increasing size, single orange red spots forming a broken line to the wing.

H.-w.: Central bar orange red, bordered with a slight brownish suffusion towards the base and a well marked marginal border of black distally, the inner edge of which is undulating. Black spots at base as on underside.

UNDERSIDE:

F.-w.: Base of wing and areas corresponding to upper spots vitreous or only scaled along the veins; costa, apex, and outer margin golden ocheous with black veins and internervular rays.

H.-w.: Basally greenish ocheous, merging into a central band by an irregular blackish line, continuous with the black on the distal end of veins and internervular rays. The black spotting is very variable, being occasionally very heavy as in fig. 10 or almost entirely wanting as in fig. 5 Some examples have the base of the hind-wing rusty brown, thus throwing into relief the central ochreous bar, thus very like the underside of *A. peneleos pelasgius*.

FEMALE:

Somewhat like the male but larger and duller.

f. PENELLA. Pl. XX., fig. 3.

A variety of female tends to follow the colour of *A. peneleos pelasgius;* thus the basal half of the fore-wing is dull orange red slightly more scaled with blackish at the apical half. The spots in 1b, 2 and 3 are somewhat transparent and slightly scaled with orange.

H.-w. is entirely orange brown with a slight darkening of the marginal border, produced by the opacity of the marginal border below. The hind-wing underside is tawny orange or reddish at the base, and on the marginal border, contrasting with the pinkish ochreous central band. Spots variable. Here also the underside suggests *A. peneleos pelasgius*.

Two other forms occurring in Uganda have been described by Eltringham as follows:—

f. argentea: General colouring paler (than typical) and the hind-wing marginal border broader and on it the shorter darker nervular ends and rays can be seen distinctly."

UNDERSIDE:

" Fore-wing ochreous area replaced by silvery grey.

H.-w.: Basal portion and hind-marginal border silvery grey, central area faintly pink."

f. exalbescens: " Resembles typical female in pattern, but all reddish areas replaced by yellowish white, and the hind-wing hind-marginal border as broad as in *f. argentea.*"

UNDERSIDE:

" Ochreous areas replaced by yellowish white, rather dusky on fore-wings, costa, apex, and hind-margin and on hind-wing basal area, and hind-marginal border."

76. ACRÆA PENELOPE VITREA. Eltr. Pl. XX., figs. 8 and 9.

Expanse 42-50 mm. General colour black and red with transparent in fore-wing.

This geographical race differs from the typical form in having all the marks of the fore-wings much larger and perfectly transparent, with occasionally a slight dusting of pinkish scales in area 1b. H.-w. orange red patch is much larger, due to the reduction both of the hind-marginal border and the dark suffusion at the base of the wing.

FEMALE:

Like the male, but duller, with the fore-wing less heavily scaled. The hind-wing patch is more orange than red.

EARLY STAGES.

We have bred neither of these races nor can we find any published records.

DISTRIBUTION:

The typical race extends through the forested areas of Uganda to the Eastern Province and Elgon. Here it meets with the *vitrea* race which has its stronghold in the Teriki and Nandi forests in N. Kavirondo. It occurs sparingly in the Lumbwa and Sotik districts.

77. ACRÆA MAIRESSEI. Auriv. Pl. XXI., fig. 1. Pl. XXII., fig. 3.

Expanse 43-55 mm. General colour black and yellow with transparent spots on fore-wing.

F.-w. generally black, except for a series of three transparent spots in the sub-apical area; a similar spot at the end of the cell; a large spot at the base of 2 followed by a much smaller one in 1a.

H.-w. black with an irregular central lemon yellow patch, which extends from the anal margin but does not reach the costa. The outer margin is indented at each nervule while the inner edge is invaded with black in 1c.

Underside:

F.-w. costa, and margin to as far as 2, lemon ochreous, the latter two strongly striated by black scaling, which, commencing at the outer margin runs upwards along the veins; indented proximally by short internervular streaks which do not reach the margin. Rest of wing, blackish and thinly scaled.

H.-w. lemon, tinged with ochreous at the marginal border and with green at the base. Veins broadly black, but tapering to points just before the cell. Areas 1c to 7 with short pointed internervular streaks placed parallel to the margin. Basal black spots large and distinct as follows: One in 9; one, very large, in 7; one at base of 6; a coalescent spot at base of 5 and 4; a large kidney-shaped spot sub-basal in 1c, followed by a small one at base; two each in 1b and 1a; one sub-basal in cell.

Female:

Resembles the male but is smaller and duller; transparent areas larger; hind-wing patch often almost white.

Early Stages.

Unknown.

Distribution:

Occurs through Uganda, near forested areas, extending to Busoga. It has not been taken in Kenya so far as we know.

78. ACRÆA MELANOXANTHA. Sharpe. Pl. XXI., fig. 2. Pl. XXII., fig. 4.

Expanse 40-48 mm. General colour black with yellow spots.

F.-w. generally black except for a lemon ochreous spot at the end of the cell; one at base of 2, and three semi-transparent spots equidistant between the end of cell and the tip of wing.

H.-w. black, with a central lemon ochreous patch, rather square cut proximally, and with an indented irregular outward margin.

Underside:

F.-w. as above but with rusty brown scaling at apex and margin.

H.-w. basal portion lemon ochreous much suffused with chocolate brown above and below the cell. Marginal border broad and rusty brown in colour striated by blackish brown internervular rays and veins.

Black spots small and arranged as follows: Two in 7, sub-basal and central; one sub-basal in cell; three in 1c, basal, sub-basal, and below origin of 2; two in 1b; one in 1a.

FEMALE:

Like the male but with larger spots in fore-wing and white patch in hind-wing.

EARLY STAGES.

Unknown.

DISTRIBUTION:

The species is very local and is known only from the South Elgon area thorugh the Kakamega forest to Kaimosi and Teriki. It is not common. The species would appear to be influenced by the similarly coloured form of *Acræa johnstoni* which is fairly common in the area.

79. ACRÆA SERVONA SERVONA. Godart. Pl. XXII., fig. 7.

Expanse 45-60 mm. General colour black and yellow with transparent areas in fore-wing.

F.-w. black, though thinly scaled; distal end of cell basal half of 2, followed by a small spot in 1b, which is continued as a streak to base; a streak at base of 3; three elongate spots in 4, 5, and 6, all transparent.

H.-w. black, but with a lemon ochreous patch in centre which takes in the base of 6, 5, 4, 3, and 2 and the mid area of 1b, and 1c, and the distal half of the cell.

UNDERSIDE:

Strongly vitreous, except at costa, apex, and margin to 2; these being lemon ochreous dusted with blackish scales and striated with black along the veins; the line of the median nervure and extreme base of veins 2, 3, and 4 are heavily scaled with yellow.

H.-w. central area lemon ochreous and shaped as above; base and broad marginal border more ochreous, the latter heavily striated with black veins and rays, and dusted with blackish scales. Black spots as follows: One each in 8 and 9; two in 7, sub-basal and central; two in cell, sub-basal and central; three in 1c; two in 1a and 1b.

FEMALE:

Somewhat like the male but larger, and with the pale patch in the hind-wing duller.

EARLY STAGES.

Unknown.

DISTRIBUTION:

From the examples before us it would appear that the North Western Uganda specimens are nearer to true *servona* than to *rhodina*,

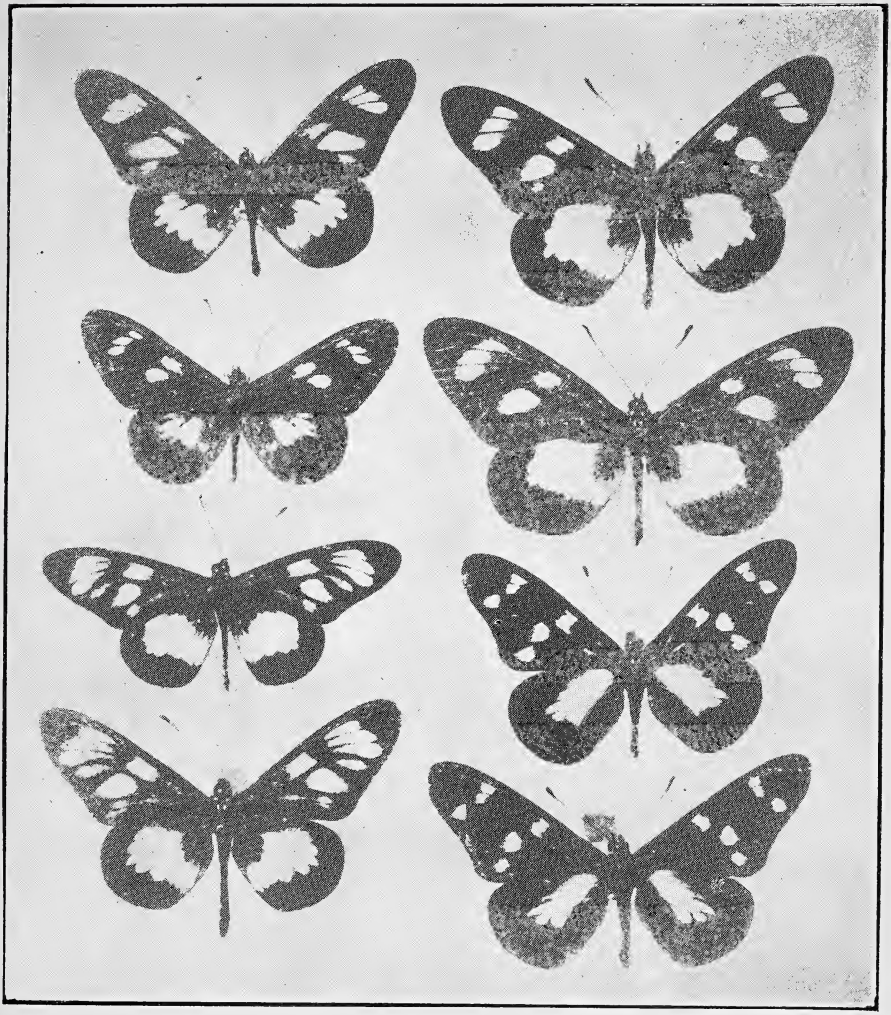

Photo: V. G. L. van Someren.

PL. XXI.

Fig. 1. Acræa mairessei. (Male.)
Fig. 2. Acræa melanoxantha. (Male.)
Fig. 3. Acræa servona rhodina. (Male.)
Fig. 4. Acræa servona rhodina. (Female.)
Fig. 5. Acræa servona kenya. (Male.)
Fig. 6. Acræa servona kenya. (Female.)
Fig. 7. Acræa oreas oreas. (Male.)
Fig. 8. Acræa oreas albimaculata.

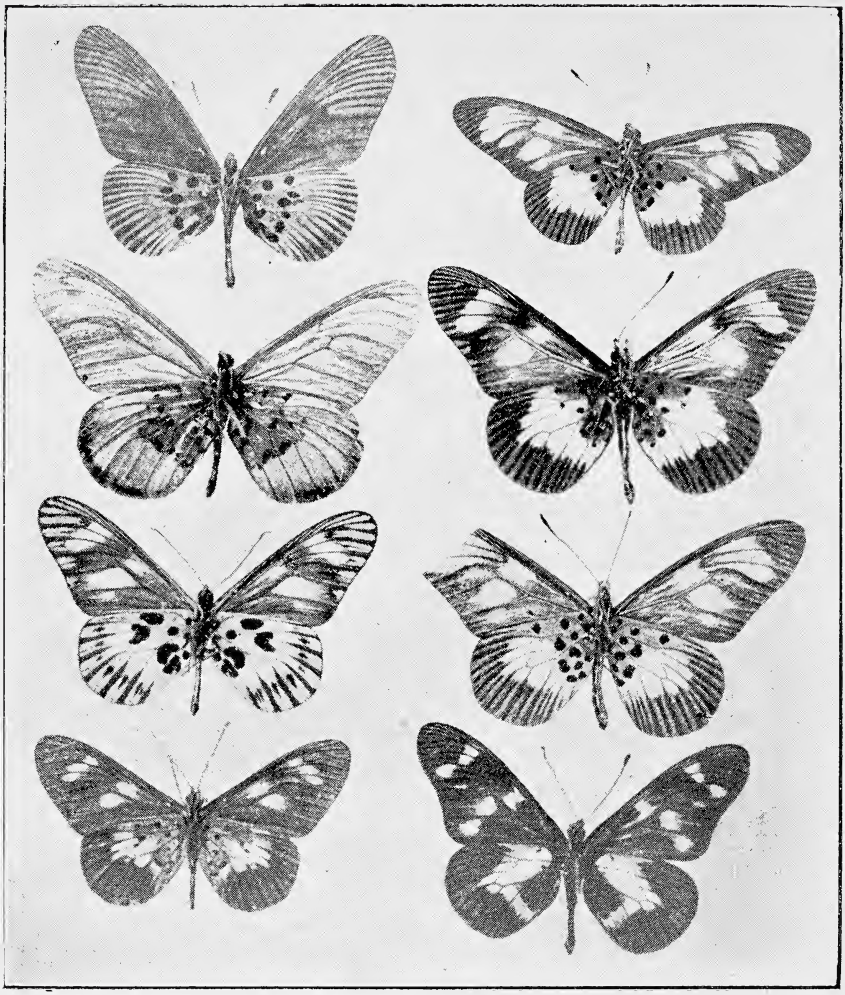

Photo: V. G. L. VAN SOMEREN.

PL. XXII.

Under surfaces.

Fig. 1. Acræa orina orineta.
Fig. 2. Acræa baxteri subsquamia.
Fig. 3. Acræa mairessei.
Fig. 4. Acræa melanoxantha.
Fig. 5. Acræa servona rhodina.
Fig. 6. Acræa servona kenya.
Fig. 7. Acræa servona servona.
Fig. 8. Acræa oreas.

i.e., the markings of the under-surface are not rusty or rufescent but golden ochreous.

Localities, Masindi, Budongo, and Bugoma forests.

80. ACRÆA SERVONA RHODINA. Roths. and Jordan. Pl. XXI., figs. 3 and 4. Pl. XXII., fig. 5.

Expanse on the whole smaller than *servona servona*, 42-50 mm., and differs from that race in having the paler areas of both wings on the undersurface replaced by rusty brown.

Distribution:

Through Central Uganda to Kavirondo. It is found on the edges of forests and along roads traversing them.

ACRÆA SERVONA ORIENTIS. Auriv.

Differs from the typical race in being more heavily scaled with black; in having much reduced transparent spots in the fore-wing with often supression of the marks in 1b and 3; and in having a larger yellow patch in the hind-wing. On the underside the apex and margin of the fore-wing, the base, and margin of the hind-wing, are yellowish.

Distribution:

We have taken this race in the Sagalla Hills, in Teita, but not elsewhere.

81. ACRÆA SERVONA KENYA. Sbsp., nov. Pl. XXI., figs. 5 and 6. Pl. XXII., fig. 6.

F.-w. heavily scaled in black, transparent spots small as in *orientis*, but not scaled; area 3 with no spot, while that in 1b is rudimentary or entirely missing.

H.-w. yellow patch large, owing to reduction of black at the base of wing. This black area is rectangular, the long axis being parallel to the body. The yellow patch extends anteriorly almost to the costa at mid 7, and is produced outwardly as a rectangle in 4, and in this respect is very like the Kenya race of *Acræa johnstoni*, and *A. lycoa kenia*, Eltr.

Underside:

F.-w. costa, apical area and margin as in *servona servona*, i.e., ochreous yellow striated with black veins and rays; median nervure and basal branches scaled with brown ochreous; hind-wing yellow patch reaching the costa in 7, otherwise as above. Basal area reddish brown but not extending beyond extreme base of cell; marginal border distally darker ochreous shading to brownish, heavily striated with

black veins and rays, the latter double in 1c. Spots as in typical form but small. The underside thus combines the characters of *servona orientis* and *rhodina*. Type, June, 1922, Meru, Mt. Kenya, in van Someren collection.

Female:

Very like the male above but underside of margins of both fore and hind-wings very dark black brown with little indication of striation.

Early Stages.

Unknown.

Distribution:

Dr. Eltringham has stated that he has seen no specimens east of the Kikuyu Escarpment; the distribution of this race is therefore an extension of the range of this species. Known only from the north and east of Mount Kenya.

82. *ACRÆA OREAS OREAS*. Sharpe. Pl. XXI., fig. 7. Pl. XXII., fig. 8.

Expanse 48-60 mm. General colour black with yellow spots.

F.-w. jet black except for yellow spots as follows: A quadrate spot extending across the cell, in the region of the base of the veins 2 and 3; a sub-basal one in 2; below and external to which is one on 1b; this area also has a streak at the base along the median; a series of three sup-apically, the first two in 5 and 6 contiguous, that in 4 nearer the margin. There is sometimes a yellow streak in 3.

H.-w. black, with a somewhat elongate quadrilateral lemon yellow patch, the direction of which is in the long arms of the wing, or almost coinciding with the lie of the cell.

Underside:

F.-w. costa, apical area and margin reddish brown, streaked with black. Spots as above; rest of wing vitreous and thinly scaled, except along the median and base of its branch, where the scaling is yellowish brown.

H.-w. yellow patch as above but paler and with an extension to the anal margin, at right angles to the main patch, and shutting in a red brown basal area containing most of the black spots. Area 8 and costa, red brown. Rest of wing dusky red brown striated with black. Black spots as follows: One in 8, one towards base of cell; two or three in 1c; two in 1b; and one in 1a.

Fore-wings angulated and concave on outer edge.

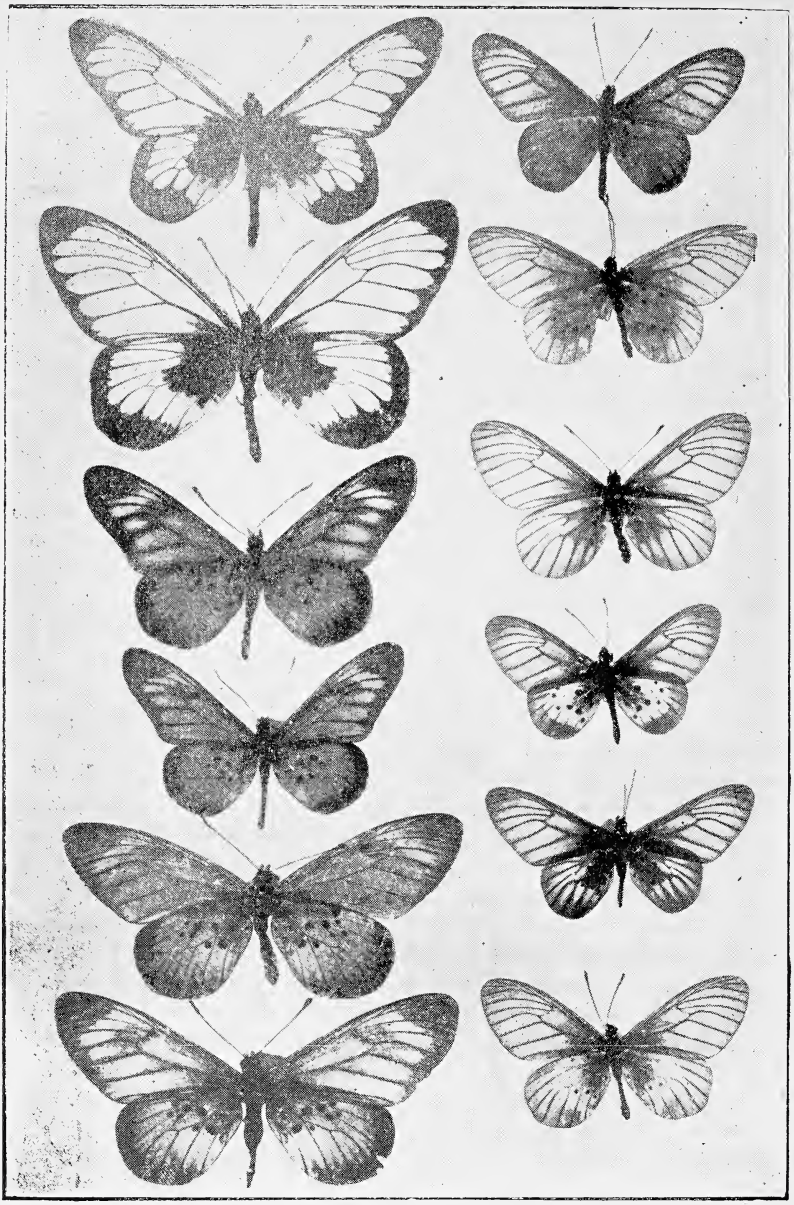

Photo: V. G. L. VAN SOMEREN.

PL. XXIII.

Fig. 1. Acræa semivitrea.
Fig. 2. Acræa semivitrea. (Female.)
Fig. 3. Acræa aubyni. (Male.)
Fig. 4. Acræa aubyni. (Male, var.)
Fig. 5. Acræa aubyni. (Female.)
Fig. 6. Acræa aubyni. (Female, var.)
Fig. 7. Acræa ?
Fig. 8. Acræa orestia.
Fig. 9. Acræa orestia f. humilis.
Fig. 10. Acræa orestia transita.
Fig. 11. Acræa orestia transita.
Fig. 12. Acræa orestia transita.

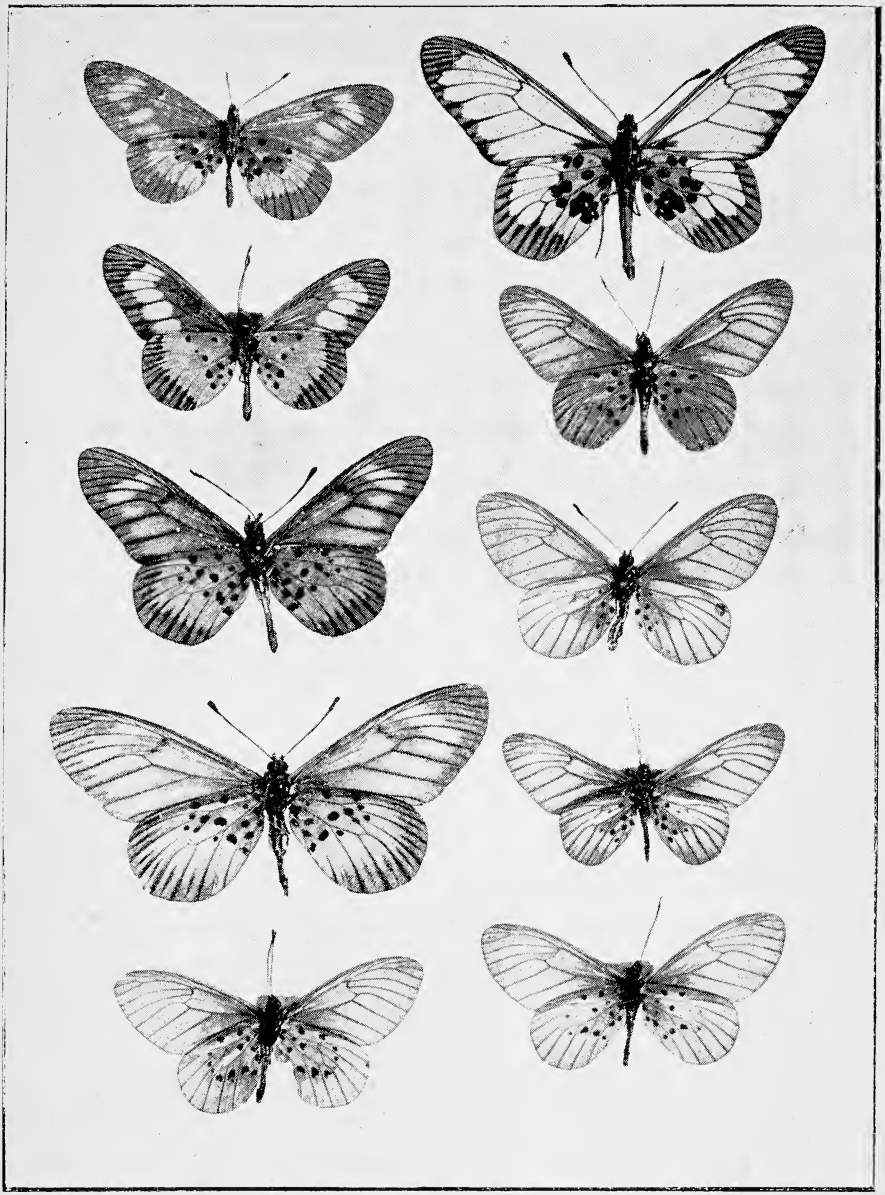

Photo: V. G. L. van Someren.

PL. XXIV.

Under surfaces.

Fig. 1. Acræa penelope penella.
Fig. 2. Acræa penelope vitrea.
Fig. 3. Acræa aubyni. (Male.)
Fig. 4. Acræa aubyni. (Female.)
Fig. 5. Acræa orestia orestia.
Fig. 6. Acræa semivitrea.
Fig. 7. Acræa ?
Fig. 8. Acræa orestia humilis.
Fig. 9. Acræa orestia transita.
Fig. 10. Acræa orestia transita.

f. ALBIMACULATA. Neave. Pl. XXI., fig. 8.

Differs from the typical form in having the fore-wing spots smaller, and white, instead of yellow.

EARLY STAGES:

Unknown.

DISTRIBUTION:

Both forms occur together throughout the range of the species in Uganda and Kenya. It is scarce in Uganda at Toro and Entebbe. It is the most common *Acræa* in the Sotik-Lumbwa area, and is almost as common from Nandi and North Kavirondo to Elgon. It is a woodland species and is fond of damp localities.

83. ACRÆA SEMIVITREA. Auriv. Pl. XXIII., figs. 1 and 2. Pl. XXIV., fig. 6.

Expanse 55-70 mm. General colour transparent with black border.

F.-w. mostly transparent, except for the costa, base of 1a and 1b, apex and margin, which are black scaled, the scaling of the margin extending a short distance up the veins in the form of triangles. Veins black.

H.-w. a black brown basal area including the basal half of 7, all the cell except the extreme apex, the extreme base of 2, half of 1c and 1b, and most of 1a. Marginal border: Upper half narrow, 1½ mm., widening rapidly in 4 to 5 mm. in 2. Central bar of wing transparent as far as middle of 2, beyond which it is lemon yellow.

UNDERSIDE:

Those areas which are black on the upper side are here lemon ochreous, slightly tinged with greenish at base of hind-wing. Apex and margins of both wings with black veins and dart-shaped internervular rays; rest of wings transparent, except for a yellow ochreous patch at inner border of hind-wing. Black spots in hind-wing large and sharply cut as follows: One in 9 at base; two close together in 7; three in cell, one sub-basal, two coalescent sub-apical, one basal; three in 1b, basal, and two confluent near mid-point; two each in 1a and 2b.

FEMALE:

Larger and duller than the male, the black not so intense, more sepia. Yellow patch in hind-wing paler, somewhat white.

84. ACRÆA AUBYNI. Eltr. Pl. XXIII., figs. 3—6. Pl. XXIV., figs. 3 and 4.

Expanse 50-58 mm. Females 64 mm. General colour red with black border. F.-w. costa, apical third and margin, sepia black; veins black; cell almost the whole of 1b, of 2 and greater part of 3, orange to brick red. A black streak cuts the base of 1b; a series of three elongate spots, transparent or fully scaled with brick red,* form a sub-apical bar to the wing. There is often a sub-apical black dot in the cell.

H.-w. mostly brick red with a slight dusty suffusion at the base (but cell almost entirely free). Marginal border 2-3 mm. wide, sepia black; inner border serrated, due to slight extension of black along veins and internervular rays. Spots as below.

UNDERSIDE:

F.-w. red areas of above show through as ochreous pink, but wing thinly scaled at costa, apex, and margin; these areas are dull golden ochreous with black veins and rays which stop short of margin.

H.-w. dull ochreous with greenish tinge at base and margin and pinkish between. Distal ends of veins black, internervular rays black but not reaching margin. Black spots as follows: One in 8; two in 7, sub-basal and central; one sub-basal in 6; two in 5, basal and sub-basal; one at extreme base of 4; one basal in 3; two in 1c, sub-basal and just below 2; two in 1b, sub-basal and central; one in 1a. Cell with two, sub-basal and central.

FEMALE:

Two forms occur: (a) somewhat male-like but larger, with a greater expanse of dull red in the fore-wing, and with most of the hind-wing ochreous pink, particularly distally; (b) in which the fore-wing red is entirely replaced by transparent patches. Spots as in the male.

EARLY STAGES:

Unknown.

DISTRIBUTION:

The coast hills and forests of Kenya, Rabai, and Sokoke. This is a very local species and somewhat difficult to capture, as it keeps high, but it is partial to a certain flowering creeper, and when feeding can be taken with ease.

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* *This variety is apparently not common, as we have only two such, out of a series of over twenty specimens.*

85. ACRÆA ORESTIA ORESTIA. Hewits. Pl. XXIII., figs. 8. Pl. XXIV., fig. 5.

Expanse 36-42 mm. General colour semi-transparent with red bases.

F.-w. semi-transparent with sparse scaling, slightly more dense at apex, margin and base. Basal area of cell, area 1b, and 2 with reddish scales.

H.-w.: Somewhat dusky at base, marginal border wide and thinly scaled with red. Black spots as below.

UNDERSIDE:

F.-w. very shiny and practically scaleless, except at costa and extreme base. Basal spot at base of costa.

H.-w.: Marginal border almost devoid of scales. Black spots as follows: Two in 7, sub-basal and central; one each sub-basal in 6 to 2; two small each in 1b and 1c, sub-basal and central; one in 1a.

FEMALE:

Very like the male, but duller and larger.

f. TRANSITA. Eltr. Pl. XXIII., figs. 10-12. Pl. XXIV., figs. 9 and 10.

Somewhat like the typical form but the red of the fore-wing is replaced by blackish at the base, and by a little white in 1b and 2, and the hind-wing patch by yellowish or white. Basal blackish suffusion more noticeable. Some males have the hind-wing patch heavily invaded by the black of the veins so that the outer edge is serrated.

f. HUMILIS. Eltr. (Not *humilis*, Sharpe.) Pl. XXIII., fig. 9. Pl. XXIV., fig. 8.

This is a large form of which both areas are devoid of any colour other than the slight dusting of blackish scales especially basally and marginally. Otherwise transparent. Black spots almost entirely wanting.

The female of this form is confusingly like *Acræa humilis*, Sharpe, but it has the bases of veins 6 and 6 free, not stalked.

EARLY STAGES:

Unknown to us, but the larvæ said to be like that of *A. alciope*.

DISTRIBUTION:

Occurs in Uganda central, and in the Eastern Province, frequenting forests, but it is more common in the Nandi Teriki regions of Kenya.

The flight is slow and weak and the insect seldom flies high.

The form with the red flush, when on the wing, is confusingly like *A. quirina* or the female of *A. quirinalis*.

86. ACRÆA HUMILIS. Sharpe. Pl. XXV., figs. 9 and 10.

Expanse 44-48 mm. General colour transparent.

Both fore and hind-wings almost devoid of scales, except along the costa, and margins of wings. Nervures brownish black. Black spots on hind-wing as below.

UNDERSIDE:

Almost entirely vitreous, but with a slight degree of brownish scaling at base and inner margin of hind-wing. Extreme base and hind-wing black with two white dots. Black spots limited to one each, almost basal, in the cell and 1c. Veins of 6 and 7 of hind-wing arise from a common stalk.

FEMALE:

Like the male but larger.

EARLY STAGES:

Unknown.

DISTRIBUTION:

Mount Elgon to Nandi and Teriki. This is by no means a common insect and is rather local. It is partial to forest clearings in damp areas.

87. ACRÆA CINEREA. Neave. Pl. XXV., figs. 2 and 6.

Expanse 40-44 mm. General colour transparent and dark greyish.

F.-w. basal two-thirds of wing semi-transparent owing to thin scaling. Terminal third more heavily dusted with blackish.

H.-w. uniformally scaled in greyish black; unspotted.

UNDERSIDE:

F.-w. practically scaleless, otherwise as above but greyer with a patch of reddish scales at base of costa.

H.-w. more greyish except at base; here the scales are Indian red in areas, half of the cell and the basal halves of 1c and 1b. Extreme base of wing black. Black spots small, one in mid cell, one on upper discocellular, two each in 1b and 1c, sub-basal and central.

FEMALE:

Very like the male but larger.

EARLY STAGES:

Unknown.

DISTRIBUTION:

This species has been taken by us in the type locality, the Tiriki Hills, and also on the edges of the Kakamega Forest and westwards to Mawakota in Uganda.

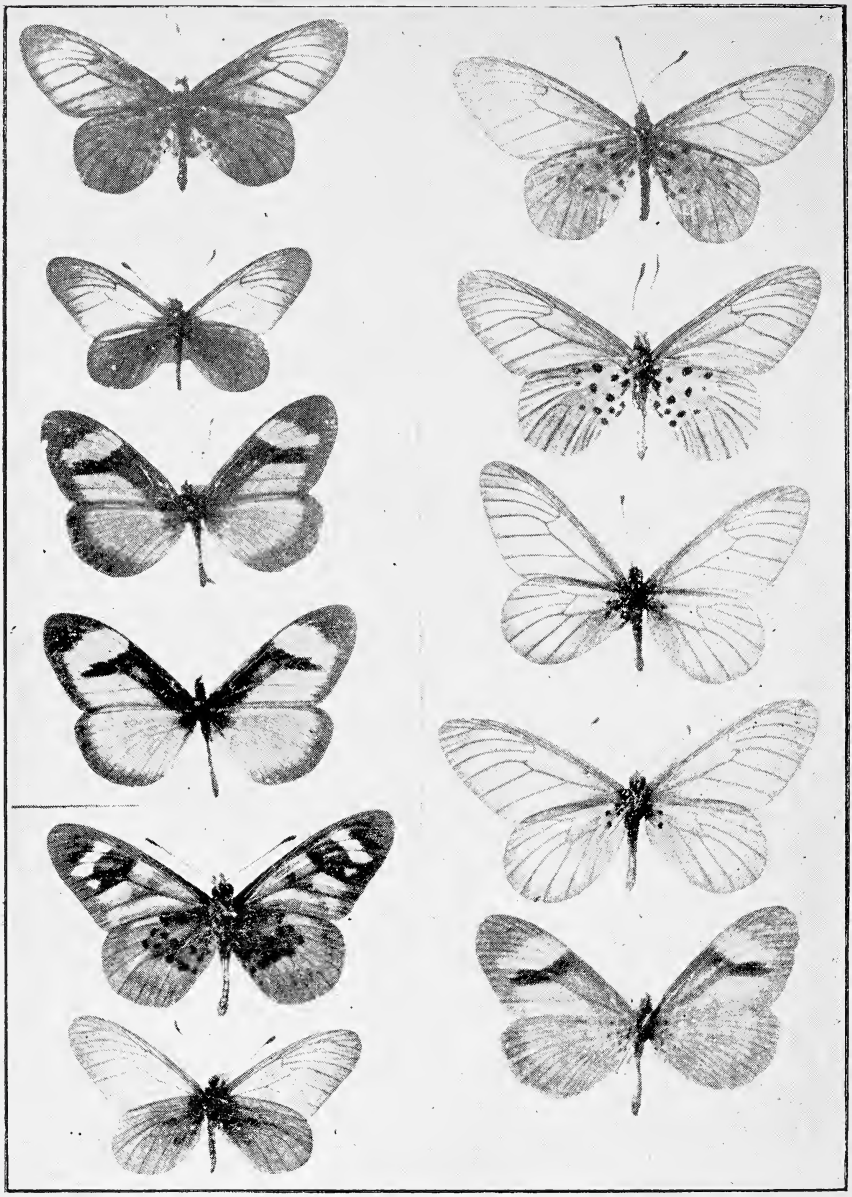

Photo: V. G. L. van Someren.

PL. XXV.

Fig. 1. Acræa quirinalis. (Male.)
Fig. 2. Acræa cinerea. (Male.)
Fig. 3. Acræa disjuncta. (Male.)
Fig. 4. Acræa disjuncta. (Female.)
Fig. 6. Acræa cinerea, underside.
Fig. 7. Acræa quirinalis. (Female.)
Fig. 8. Acræ quirinalis, underside.
Fig. 9. Acræa humilis. (Male.)
Fig. 10. Acræa humilis (female), underside.
Fig. 11. Acræa disjuncta, underside.

88. ACRÆA QUIRINALIS. Grose-Smith. Pl. XXV., figs. 1, 7 & 8.

Expanse 40-52 mm. General colour red with semi-transparent borders. F.-w. brick-red at basal part of wing, occupying the lower half of the cell, the greater part of 1a and 1b and basal half of 2; body of wing semi-transparent and very thinly scaled; costa, apex and margin more heavily scaled with black. The extreme base of 1b is occupied with black.

H.-w. costa and margin blackish with heavier black nervures; the marginal border is wide, 5 mm. Central area of wing red, slightly suffused with black at base of 1c and cell. Black spots not very distinct, distributed as below.

UNDERSIDE:

F.-w. shiny and scaleless, otherwise showing the colours from above.

H.-w.: Greenish white at base of wing. Rest of wing sparsely scaled on spots. These spots are as follows: One each in 9 and 8; two in 7; one in 6; one at base of 5; one very small at base of 2 and 3; three in 1c, basal, sub-basal, and central; two in 1b; one or two in 1a.

FEMALE:

Somewhat like the male but more transparent throughout. The fore-wing margin more convex. Spotting of the hind-wing as in the male.

EARLY STAGES:

Unknown.

DISTRIBUTION:

We have taken this species from Kisumu, Nandi-Tiriki district, and North Kavirondo to Chagwe in Uganda. The females are extremely like *orestia* and *iturina*. The insect is not very common in Kenya, but was met with in considerable numbers at Mulange in Uganda.

89. ACRÆA AMICITIÆ. Heron. Pl. XIX., fig. 8. Pl. XXV., fig. 5.

Expanse 50-58 mm. General colour red brown with black apices.

F.-w. cell, except for extreme base and a black bar at junction of mid and distal third, red brown; most of area 1b the same, except that at the distal end the red is traversed by a blackish line; a large sub-basal spot in 2; and a small one in 3. There is a sub-apical bar of semi-transparent quadrate spots in 4-6. Rest of wing brownish black.

H.-w. red brown with an area adjoining the near side of the cell, but not extending beyond it, dusted with black. Marginal border red brown divided up by black nervular lines, those in areas 1b to 3 joined proximally. Black spots as below.

Underside:

F.-w. dull and semi-scaled, except at margin and apex which are rusty brown; a black line is present at apex of cell on discocellulars; rest of wing shows the pattern above, but dull.

H.-w.: Basal area reddish brown except at distal end and base of 7, and bar of cell. Marginal border rusty ochreous with the pattern of upper side showing through. Mid area of wing rusty pink. Black spots as follows: sometimes one in 8; two in 7; two in 6 and 5; one in mid cell; one at apex 3; and one sub-basal in 2; two each in 1c and 1b; one in 1a.

Early Stages:

Unknown.

Distribution:

This is a very local species and is confined to the Ruwenzori Range and Kigezi country. It has been taken at Toro.

90. ACRÆA ANSORGEI. Grosse-Smith. Pl. XXIV., figs. 1—15.
Acræa conjuncta. Grosse-Smith (Syn.) Pl. XXVII., figs. 1—12.

Before describing this species it is advisable to note first of all, that as the result of breeding experiments it has been definitely proved that the insect known hitherto as *A. ansorgei* and *conjuncta* are varieties of one and the same species. Such a possibility was suggested by Eltringham in his Monograph, page 319, but it fell to Felix Bryk of the Swedish (Mt. Elgon) Research Station to prove definitely that this was the case. Bryk had a limited number of specimens from a batch of eggs, and these gave results which proved the supposition to be correct. Ref. Felix Bryk., Entomol. Rundschan, 42, Jan., 1925. No. 7, page 27. No. 8, pp. 31-32.

Very shortly after this it was our good fortune to obtain batches of eggs from Uplands near Escarpment, and from these we have obtained no less than seventeen distinct forms of the insect, including typical *ansorgei* and *conjuncta*. The results from these families give conclusive evidence of the extreme polymorphism of this species.

We shall therefore describe the predominant forms first, commencing with that known as:—

f. CONJUNCTA.

Expanse (male) 40-48 mm. General colour orange and black.

F.-w. ground colour dark brownish black with tawny yellow spots as follows: A quadrate spot towards the end of the cell; this is contiguous to a small streak at the base of 3, followed by two large quadrate spots in 2 and 1b, with very frequently an extension in 1a.

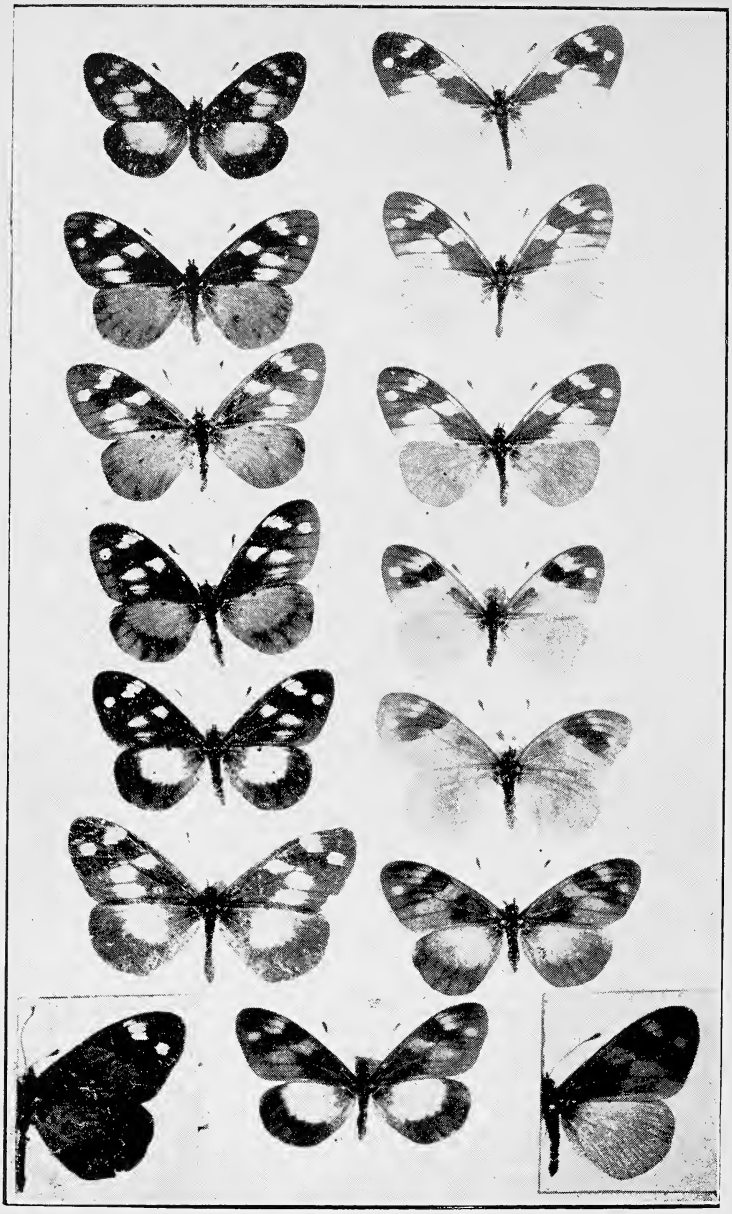

Photo: V. G. L. van Someren.

PL. XXVI.

Fig. 1. Acræa ansorgei, f. nr. interrupta.
Fig. 2. Acræa ansorgei, f. nov.
Fig. 3. Acræa ansorgei, f. nov.
Fig. 4. Acræa ansorgei, f. nov.
Fig. 5. Acræa ansorgei, f pica.
Fig. 6. Acræa ansorgei, f silacea.
Fig. 7. Acræa ansorgei, f. nr. lutealba.
Fig. 8. Acræa ansorgei ansorgei. (Female.)
Fig. 9. Acræa ansorgei, f. loveni.
Fig. 10. Acræa ansorgei, f. nov.
Fig. 11. Acræa ansorgei, f. nov.
Fig. 12. Acræa ansorgei, f. nr. suffusa.
Fig. 13. Acræa ansorgei, f. nov.
Fig. 14. Acræa ansorgei, f. nov.
Fig. 15. Acræa ansorgei, f. nov.

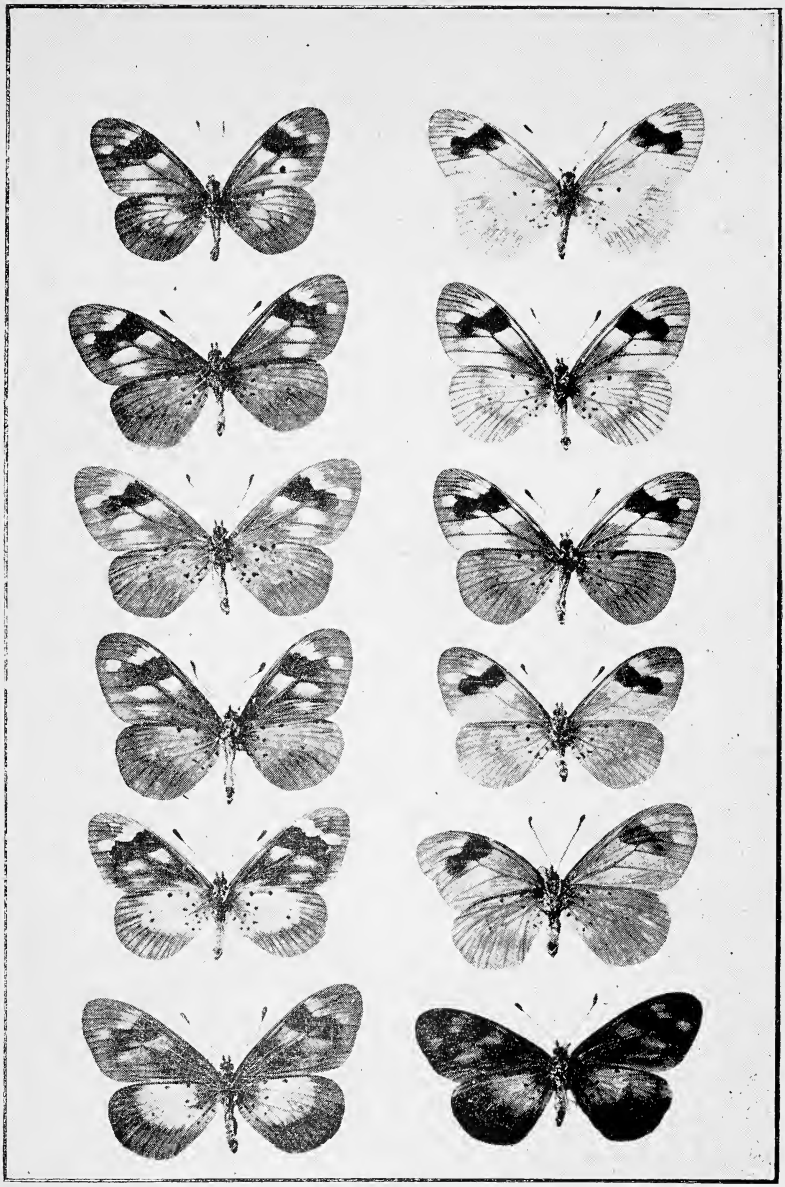

Photo: V. G. L. van Someren.

PL. XXVII.

Under surfaces.

Variation in undersides of Acræa ansorgei.

H.-w. mostly tawny orange with a black suffusion at base, continuous with a wide marginal border of brownish black. The black spotting on the upper side is variable, but that in 4 persists in the majority of specimens.

In this form we find both males and females, in fact the majority of males are of this type and this is the commonest variety.

UNDERSIDE:

Fore and hind wings tawny ochreous with the areas corresponding to the black above, darker brownish. Black spots as follows: Two in 7; one each in 5, 4, and 3, all sub-basal; three in 1c, basal and one on either side of origin vein 2; two each in 1b and 1a; cell with a central oblique streak.

A modification of this form in which the central band is composed of isolated spots of reduced size with that in 1b vestigial, has been named by Eltringham *f. interrupta*. The form though met with fairly often in the Elgon area is rare in the Escarpment district. There is a further variation which occurs in our bred series from Uplands. This has the same dark ground colour, but the spots and central area in the hind-wing are naple yellow.

FEMALE:

For purposes of description, however, we will divide the forms into two groups:—

(a) Those which conform to the *conjuncta* pattern, and which exhibit modification thereof, having a broad hind-marginal border; and

(b) Those which fall into the *ansorgei* group, *i.e.*, without hind-marginal border, and usually somewhat larger.

(a) 1. *f. conjuncta*. A common form is like the male but larger.

2. Fore and hind-wing light areas, naples yellow. =*f. nov.*

2a. Very like the form *conjuncta*, but pale areas rich tawny orange except those of the sub-apical areas; these are white. =*f. nov.*

3. Fore and hind-wing light areas pale ochreous=*f. silacea*. Eltr.

4. Fore and hind-wing light spots pure white, with that in 1b, reduced to a streak. =*f. pica*. Eltr.

5. Fore-wing spots white, hind patch orchreous=*f. mutata*. Eltr.

6. F.-w. spots large, rich naples yellow, hind-wing entirely tawny orange with only slight dusky marginal border= *f. nov.*

7. H.-w. as in 6 buff fore-wing spots pure white. =*f. nov.*

8. F.-w. as in 7 except for spot in cell which is tinged with orange, and that of 1b, vestigial; hind-wing tanwy orange with a wide black marginal border.

9. F.-w. spots rich orange red; hind-wing patch white or with pinkish ochreous distally; marginal border broadly black =*f. lutealba.* Eltr.

10. Somewhat as in 9 but with larger orange spots and radiating orange rays in 3 to 6 extending to outer margin; hind-wing patch proximally whitish shading to orange orcheous; and broad brownish black marginal border.

(b) 1. A form in which the black areas are limited to the basal ⅔ of cell and median, and to the apical half of the wing. The latter containing a sub-apical bar of four white spots; rest of fore and hind-wing creamy white. =*f. ANSORGEI.*

1a. Very like 1, but the hind-wing with a narrow marginal border, from which short black rays extend inward along the nervures and internervular spaces.

2. Somewhat like 1, but fore-wing spots creamy ocheous. Hind-wing rich ochreous, slightly paler centro-basally. =*f. loveni.* Bryk.

2a. A slight modification of this form is one in which the pale areas are all more orchreous. =*f. nov.*

3. F.-w. as in *f. ansorgei*, but the hind-wing uniform tawny orange. =*f. nov.*

4. F.-w. tawny orange, and hind-wing uniform creamy ocheous =*f. nov.*

5. F.-w. orange ochreous, with black scaling limited to the basal ⅔ of the cell; a heavy black sub-apical bar and slight black scaling at apex. H.w-. uniform orange. =*f. nov.*

5a. Somewhat like 5, but with black in cell limited to a single spot, centrally. Sub-apical bar black, other spots in fore-wing indicated by slightly paler scaling.

6. Very like 5a, but hind-wing with a dusting of black and brown scales on hind-marginal border. =*f. suffusa.* Eltr.

7. F.-w. light spots rich tawny orange; that in 1b, extending to margin; black at base of wing filling the base of costa, the cell, 1b, and base of 2. H.-w. rich tawny orange with marginal blackish rays. =*f. nov.*

Early Stages:

The eggs are of the usual acraeine form, but rather more squat. They are laid in groups on the under surface of the leaves of a creeper *(Urera hypaelodendron.* Wedd. *(Urticaceæ)* which stings if handled carelessly. The urticating spines are situated on the lower side of the leaf at the base and on the stalk. The young larva is brownish above

with paler underside. It remains brownish above with vertical ochreous line in front of each segment, and greenish below, until the third moult when it turns uniform pale green. It remains this colour up to time of pupating, but when it suspends itself lateral yellow spots appear in the spiracular line. The pupa is rather short and squat, pale green in colour with a series of yellow abdominal spots. When the insect emerges, the pupal case becomes white.

DISTRIBUTION:

The species *(ansorgei)* has a fairy wide range but appears to be restricted to certain types of country. Its home is certainly in the Uplands Escarpment area, 6,000 to 8,000 feet; and it is fairly common in the Elgon area. It also occurs, however, in Toro in Uganda.

Of the various forms *conjuncta* is certainly the commonest, followed by *ansorgei*, then by *lutealba;* the other forms are scarce and occur in about equal numbers. It has been suggested that the insect is influenced by the polymorphic *Ac. johnstoni*, but we do not consider this to be the case in the Escarpment area.

91. ACRÆA DISJUNCTA. Grose-Smith. Pl. XXV., figs. 3, 4 & 11. Expanse 43-50 mm. General colour yellow with black borders.

F.-w. most of the wing golden ochreous except for the costa, apex, and margin, cell and base of 1a and 2b. These are brownish black. In addition there is a darker blackish bar occupying almost the whole of area 3, sometimes reaching the margin, often not.

H.-w. mostly golden ocheous with a slight brownish black suffusion at extreme base and with a sepia black marginal border, 2 to 2½ mm. wide, tapering off at inner edge.

UNDERSIDE:

F.-w. a dull replica of the upper but with margin and apex more ochreous.

H.-w. dusky ochreous with long radiations of dusky cells along the nervures and internervular rays. Black spots minute, one each in 9 and 8; two in 7; two in cell, and two each in 1c, 1b, and 1a.

FEMALE:

Very like the male but duller and often with some yellow at the apex of the cell.

EARLY STAGES:

Unknown.

DISTRIBUTION:

Common in Kavirondo to Mt. Elgon, becoming more scarce towards N. Uganda.

Flight is slow and weak. On the wing it looks very like *A. alciope*.

92. A. ALCIOPE. Hewits. Pl. XXVIII., figs. 1-8. Pl. XXXI., figs. 6-10.

Expanse 55-68 mm. General colour yellow with black borders.

F.-w. brownish black at margin, apex, and costa, with an extension into the cell, the base of 6-3, 1a, and 1b; rest of wing golden ochreous.

H.-w. mostly golden ochreous, with a brown black marginal border, 3-4 mm. wide but tapering at the anal angle. Nervures and internervular rays deeper blackish and extending beyond inner edge of border. A slight blackish suffusion at extreme base.

UNDERSIDE:

F.-w. pattern as above, but dark area replaced with dusky ochreous and darker just beyond cell. The apex and margin ornamented with black tips to veins and rays.

H.-w. ochreous with long blackish brown rays and veins, the former almost reaching the cell. Black spots as follows: One each in 8 and 9; two in 7; two in cell close together followed by a black streak sub-apically; three in 1c; one or two in 1b, and one in 1a.

FEMALE:

The females are variable and have received various varietal names.

1. A form very like the male, but fore-wing bar narrow and indented both proximally and distally. Hind-wing dark ochreous.
=*f. alciope.* Pl. XXVIII., fig. 2. Pl. XXXI., fig. 7.

2. F.-w. brownish black, with angled orange band, sharply defined externally, and deeply indented internally (internervularly) in areas 1b, 2 and 3. H.-w. with brownish black base, and brown marginal border. A white band crosses the centre of the wing and this is separated from the marginal border by an orange or tawny zone. This zone is ornamented by brownish black rays and veins which stop at the white band. =*f. aurivillii.* Pl. XXVIII., figs. 5 and 7.

3. Is a modification of the above in that the marginal border is more uniform brownish black with only slight indication of radiation Pl. XXXI., fig. 8.

4. F.-w. much as in 2 but inner edge of yellow bar accentuated by black spots in areas 1b, 2, and 3; the distal edge heavily invaded by the marginal brown black in these same areas.

H.-w. tawny or red brown, with a blackish area at the apex and extreme margin, and from these, black rays and veins radiate to the centre of the wing. =*f. macarina.* Pl. XXVIII., fig. 4. Pl. XXI., fig. 9.

5. A modification of 4 in which the fore-wing bar is red brown like the hind-wing. var. Pl. XXVIII., fig. 8.

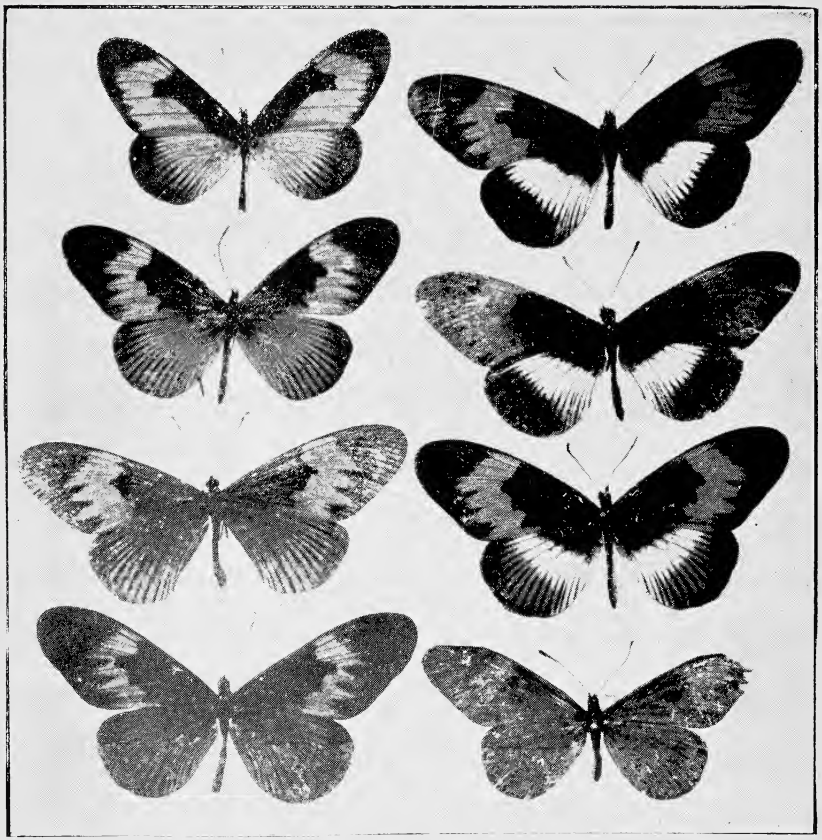

Photo: V. G. L. van Someren.

PL. XXVIII.

Fig. 1. Acræa alciope.
Fig. 2. Acræa alciope. (Female.)
Fig. 3. Acræa alciope macarina, var.
Fig. 4. Acræa alciope macarina.
Fig. 5. Acræa alciope nr. aurivilii.
Fig. 6. Acræa alciope.
Fig. 7. Acræa alciope aurivilii, var.
Fig. 8. Acræa alciope, var.

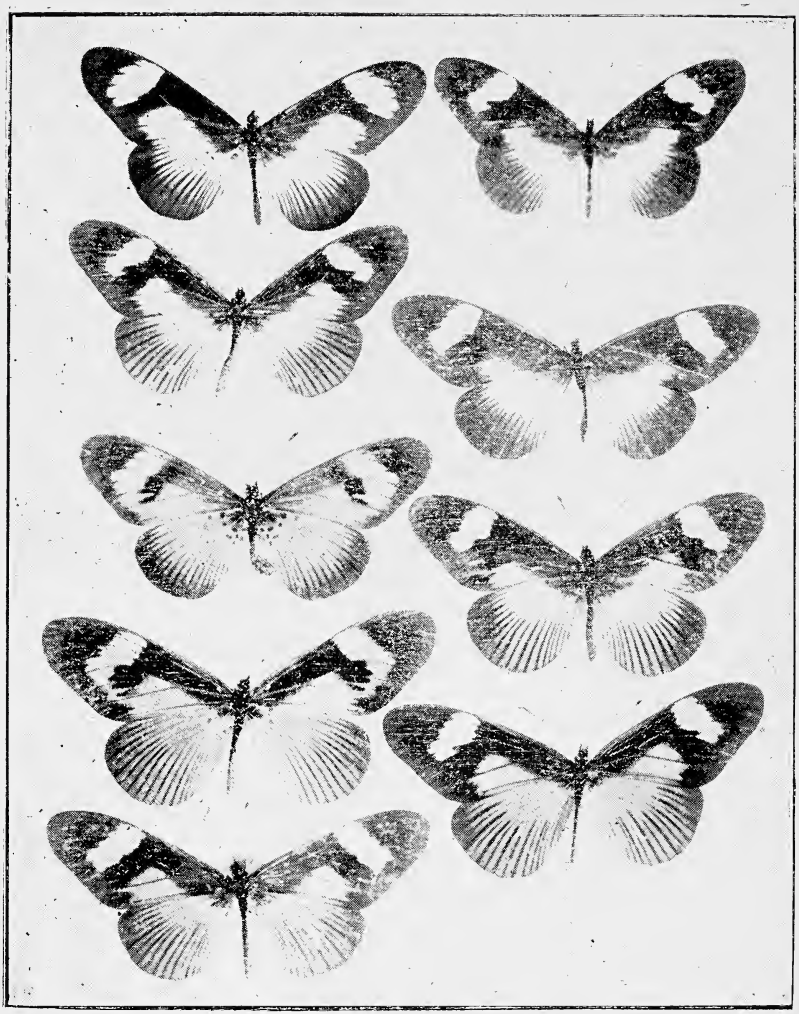

Photo: V. G. L. van Someren.

PL. XXIX.

Fig. 1. Acræa jodutta jodutta.
Fig. 2. Acræa jodutta, var.
Fig. 3. Acræa jodutta dorothæa, var.
Fig. 4. Acræa jodutta dorothæa, var.
Fig. 5. Acræa jodutta dorothæa.
Fig. 6. Acræa jodutta. (Female.)
Fig. 7. Acræa jodutta. (Female.)
Fig. 8. Acræa jodutta carmentis.
Fig. 9. Acræa jodutta interjecta.

6. A form in which the fore-wing is as in 4 or 2, but the hind-wing is tawny ochreous with a patch of blackish at the apex and along the extreme margin. The rays and veins are blackish.
=var., Pl. XXVIII., fig. 3. Pl. XXXI., fig. 10.

Early Stages:
Larvæ pale green above, yellowish below with darker lines dorsaly; most spines long and black but those along the spiracular line are tawny ochreous. Pupa brownish or black, with black lines on wing cases. Abdomen decorated with black rings enclosing yellow spots, each spot with a small projection.

Distribution:
This is a common species throughout Uganda to Elgon. It appears to be most plentiful in Chagwe and Busoga.

93. ACRÆA JODUTTA. Fabr. Pl. XXIX., figs. 1-9. Pl. XXXI., figs. 3-5.
Expanse 56-72 mm. General colour yellow and black.
F.-w. brownish black, with a large sub-apical patch of ochreous extending from the costa to the upper part of 3, and widening in 4, 5 and 6. There is a second yellowish patch occupying the central area of 1a and 1b and the base of 2.
H.-w. a central bar of yellowish bordered proximally by the blackish scaling at the base of the wing and distally by a wide brownish black marginal border from which the blackish rays and veins radiate.

Underside:
F.-w. blackish areas of above replaced by dusky ochreous in the base of cell, apex, and margin. Apex of cell and bar across the wing more blackish. Rays and veins at margin and apex, blackish.
H.-w. dusky ochreous with some rufous scales at the base. Veins and internervular rays blackish, stopping short of the cell. Black spots as follows: One each in 9 and 8; two in 7; two in cell, sub-basal, and central, followed by a dark streak; three in 1c; two in 1b and 1c.

Female:
Variable, the typical form (1) is like the male in pattern, but the yellow is replaced by white and the dark areas are black. Pl. XXIX., figs. 6 and 7.
(2) Some specimens show a tendency to a connection of the two pale areas in the fore-wing by the presence of whitish spots in 2=
=*f. carmentis.* Pl. XXIX., fig. 8.
(3) F.-w. pattern as in the male, but the pale areas are all orange and broader; the sub-apical patch is anteriorly whitish, while the

black marginal border of the hind-wing is concentrated towards the apex. The blackish rays and nervures run up almost to the cell. Base of hind-wing with slight backish suffusion=*f. dorothæa.* Pl. XXIX, fig. 5.

(a) A variation of the above has the sub-apical bar continuous with the inner margin, and there is no black on the base of the hind-wing. Pl. XXIX., figs. 3 and 4.

(4) Pattern as in 3 but the fore-wing light areas are pale ochreous, tending to white in the sub-apical bar. This pale ochreous is extended on to the hind-wing as a basal and central zone; rest of hind-wing orange with a dusting of blackish scales at the apex. Dark rays marked. Pl. XXIX., fig. 2.

5. Pattern as in *f. dorothæe*, but sub-apical bar pure white; orange patch in inner margin with a white line in 1b; hind-wing rich orange tawny with blackish at apex and black rays distinct. Near *f. interjecta.* Pl. XXIX., fig. 9.

The various forms of females are associated mimetically with certain *Planemae*, thus the typical and *carmentis* variety are very like the female of *Planema montana.* The *dorothæe* form is associated with *Planema tellus*, while the *interjecta* mimics *Danaida chrysippus*, its model.

Acræa jodutta in its various forms is extremely like *Acræa esebria*, especially so in East Uganda, where *esbria* tends to lose the wide black marginal border to the hind-wing, its place being taken by black rays.

Early Stages:

The eggs present the usual characteristics of the Acræine group, but are rather more eliptiform. They are laid on a plant belonging to the Urticacaea and closely related to the food plant of *A. esebria.* The larvæ are olive brown at first, but later become ochreous olive with black and ochreous bands to each segment. The underside is uniform olive ochreous. The pupa is rather elongate, either black or brownish with black lines in thorax and wing scuta and black contiguous rings, each containing a yellow spot, on the abdominal segments.

Distribution:

A. jodutta is widely spread in Uganda, extending from the Toro and Lake Albert area east to Mt. Elgon, where it undoubtedly meets *A. esebria*, but whether the two intergrade we do not know. There is, as already stated, a tendency for this latter to assume *jodutta*-like characters.

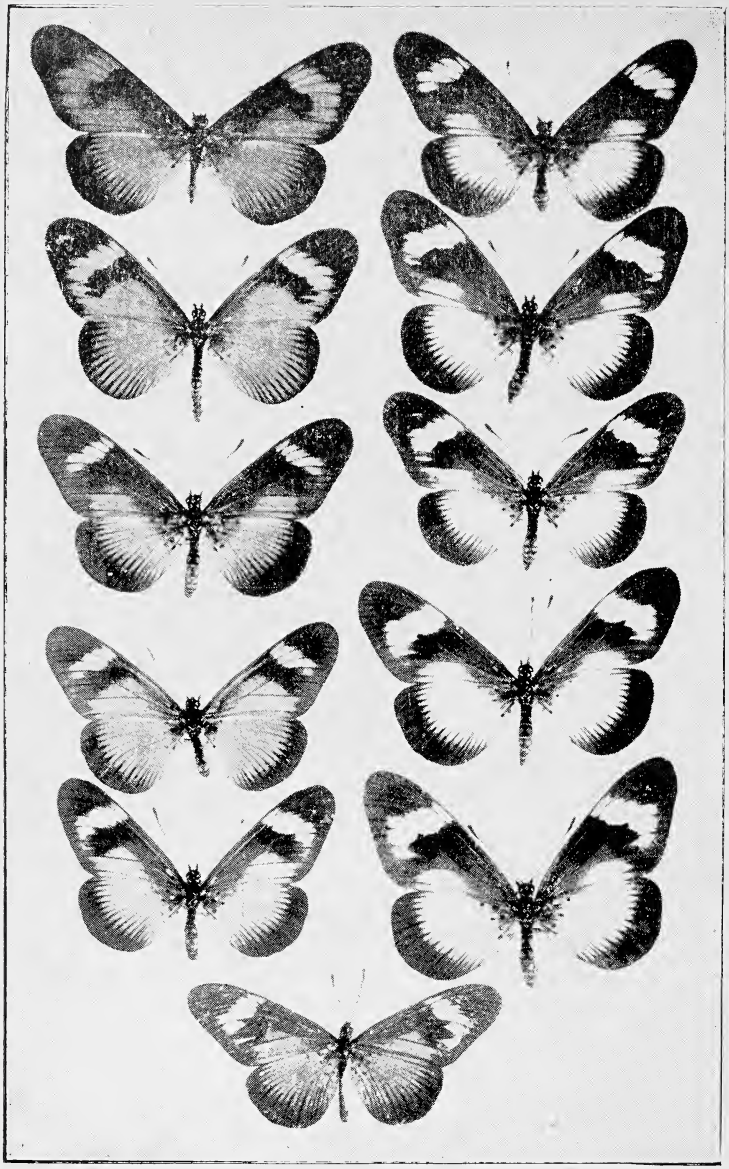

Photo: V. G. L. VAN SOMEREN.

PL. XXX.

Under surfaces.

Fig. 1. Acræa esebria.
Fig. 2. Acræa esebria, var.
Fig. 3. Acræa esebria jacksoni.
Fig. 4. Acræa esebria, var.
Fig. 5. Acræa esebria, typical.
Fig. 6. Acræa esebria esebria.
Fig. 7. Acræa esebria f. protea.
Fig. 8. Acræa esebria, var.
Fig. 9. Acræa esebria. (Female.)
Fig. 10. Acræa esebria f. monteironis.
Fig. 11. Acræa esebria, var.

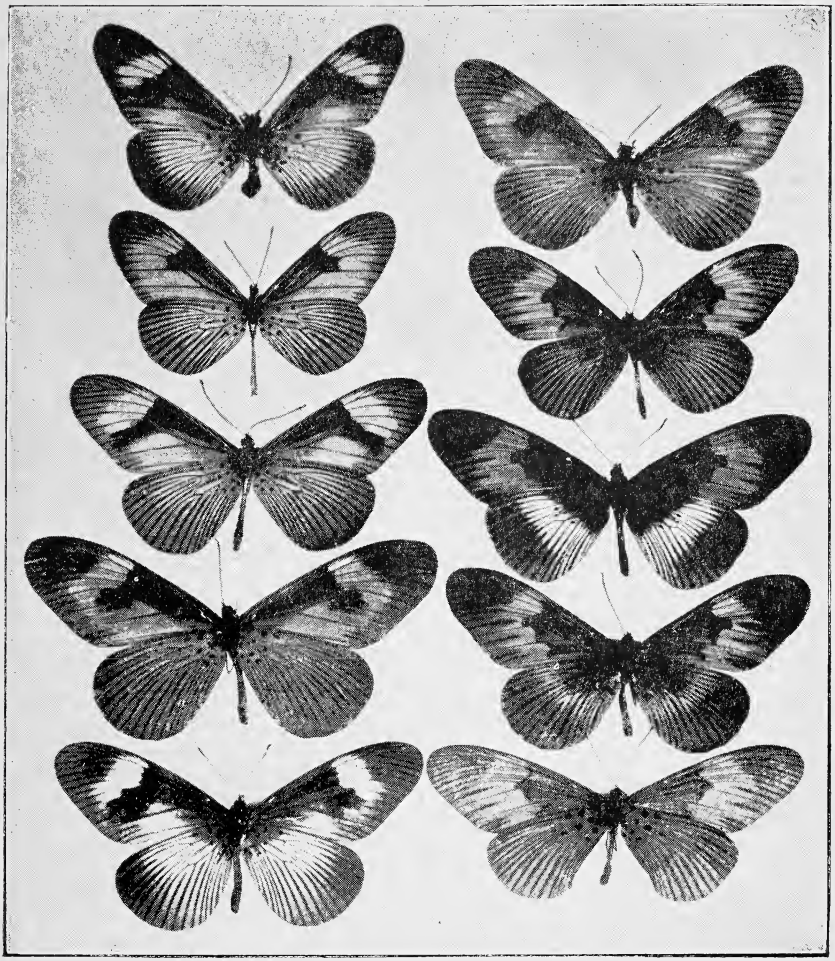

Photo: V. G. L. van Somerɛn.

PL. XXXI.

Under surfaces.

Fig. 1. Acræa esebria. (Female.)
Fig. 2. Acræa esebria. (Male.)
Fig. 3. Acræa jodutta. (Male.)
Fig. 4. Acræa jodutta, f. dorothæa.
Fig. 5. Acræa jodutta. (Female.)
Fig. 6. Acræa alciope. (Male.)
Fig. 7. Acræe alciope. (Female.)
Fig. 8. Acræa alciope f. aurivilii.
Fig. 9. Acræa alciope f. macarina.
Fig. 10. Acræa alciope, var.

94. ACRÆA ESEBRIA. Hewit. Pl. XXX, figs 1—11. Pl. XXXI., figs. 1 and 2.

Expanse 55-70 mm. In this species the males are variable. The typical male is as follows: F.-w. blackish brown with a narrow sub-apical bar of ochreous spots extending from the costa in gradually increasing width to area 4, then rapidly decreasing in 3. Inner margin with a tawny orange patch in 1a, central in 1b, and basal in 2.

H.-w. central area tawny orange; a blackish suffusion at the base, and a wide (4-5 mm.) marginal band, from the inner edge of which the black enters slightly up the nervures and rays.

UNDERSIDE:

The blackish areas of above replaced by dusky ochreous except in the cell and bar distal to it; these are blackish; pale areas dull ochreous.

H.-w. tawny ochreous slightly greyish at base and dusky at margin. Veins and internervular rays extend from the margin to the cell. Spots as follows: One each in 9 and 8; two in 7, sub-basal and end of basal third; one at base of 5; two in cell, towards base; a streak in cell; a smaller dot in 2 and 4; three in 1c; two each sub-basal in 1b and 1a.

FEMALE:

Like the male but fore-wing bar wide and more whitish. Variation in both sexes are common, the following being most distinct:

(1) A variety in which the pale areas of both fore and hind-wings are rich tawny orange. =*f. jacksoni.* Pl. XXX., fig. 3.

(1a) A modification of (1), in which the sub-apical bar and pattern on inner margin are continuous. This variety occurs mostly in females. Pl. XXX., fig. 1.

(2) Like (1a) but the orange colour invades the greater part of the cell to the costa; very little black at the base of hind-wing and black marginal border very narrow, its place being taken by black radial lines. Pl. XXX., fig. 2.

(2a) Like 2 but black bar extending across fore-wing. Pl. XXX., fig. 4.

(3) All the pale areas of both fore and hind-wings pale ochreous. =*f. protea.* Trimen, Pl. XXX., fig. 7.

(3a) As in 2 but the fore-wing bar is white. Pl. XXX., fig. 11.

(3b) Like 3 but the ochreous sub-apical bar and patch on inner margin continuous through area 2. Pl. XXX., fig. 8.

(4) A form in which the pale areas are tawny ochreous as in *jodutta.* Pl. XXX, fig. 6.

(5) A variety in which all the pale areas of both fore and hind-wings are pure white, with an extension of the sub-apical bar in 2, either separate from or continuous with the patch on the inner margin =*f. monteironis*. Butl. Pl. XXX., fig. 10.

There would appear to be no geographical races, but it is worth noting that the species, as it occurs at the coast of Kenya inland to Kilimanjaro, is a much smaller insect than those occurring inland (Nairobi to Elgon), with the dark areas more sepia. The inland form is thus larger and with black borders.

Early Stages:

The eggs of this species are laid in groups on the undersurface of the leaves of *Ponzolzia parasitica*, *Schewanfo (Urticaceæ)*, a plant which grows on the borders of open areas of forest where there is sufficient moisture and shade.

The larvæ are at first olive brown but at the second moult olive subsequently changing to olive ochreous with, at the centre of each segment a black vertical line outlined with ochreous and brown. A wide spiracular line of ochreous runs the length of the body from the second to the penultimate segment. From this is a narrow interrupted black line; lower surface of the body, brownish olive. Head brownish black with a V-shaped central mark. Spines long and black except those on the body line, these are ochreous.

Pupa: Elongate, white, or ochreous, with black lines on the wing cases and thorax, two containing chains or black marks dorso-laterally and ventrally run the length of the abdomen, each " link " with a pale yellowish or orange central spot.

Distribution:

From the coast of Kenya inland through the highlands (but not above 8,000 feet) to Elgon and thence west through Uganda.

The mimetic associations of this insect are difficult. The tawny orange form appears to be the model of *Pseudacræa rogersi*, on the Rabai Hills, and of *Papilio dardanus*, *f. mixtus*, round Nairobi. The monteronis form is associated with the female of *Planema montana* and with *Amauris niavius dominicanus*.

The association of this species with *A. jodutta* in Uganda has already been referred to on page 238.

95. ACRÆA LYCOA. Godart. Pl. XXXII., figs. 1—11. Pl. XXXIV., figs. 1—5.

Expanse 58-62 mm. General colour blackish with white spots.

Dr. Eltringham has divided this species into general geographical forms, but they are somewhat difficult to follow from the large material at our disposal, we therefore quote his descriptions.

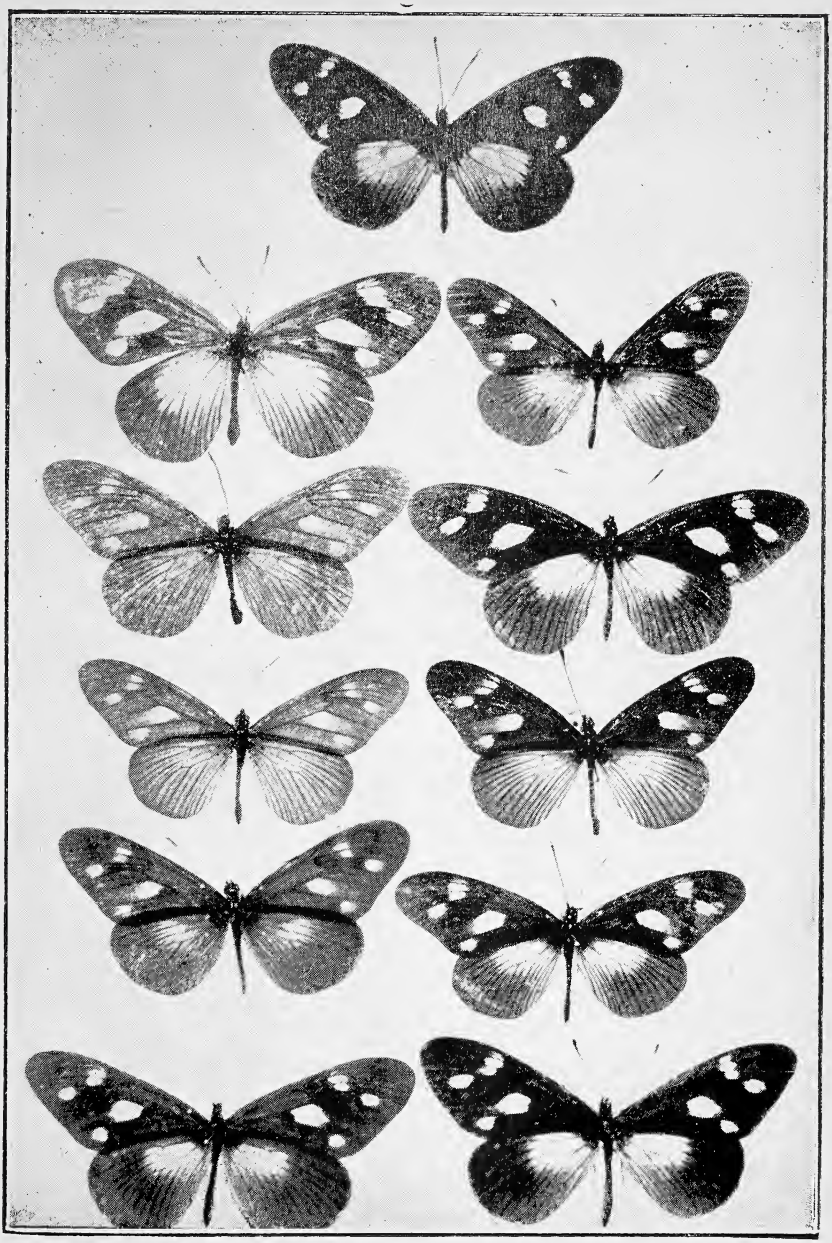

Photo: V. G. L. VAN SOMEREN.

PL. XXXII.

Fig. 1. Acræa lycoa kenia.
Fig. 2. Acræa lycoa media.
Fig. 3. Acræa lycoa entebbia.
Fig. 4. Acræa lycoa entebbia.
Fig. 5. Acræa lycoa entebbia.
Fig. 6. Acræa lycoa tirika.
Fig. 7. Acræ lycoa tirika.
Fig. 8. Acræa lycoa entebbia.
Fig. 9. Acræa lycoa tirika.
Fig. 10. Acræa lycoa tirika.
Fig. 11. Acræa lycoa entebbia.

95a. A. lycoa media, subsp. Pl. XXXII, fig. 2.

" The male is distinguished by slightly heavier scaling and greater distinctness of the pale spots in the fore-wing. The female has a darker ground-colour and a slightly smaller and more distinctly outlined white hind-wing patch."

95b. A. lycoa bukoba. subsp.

" Female fore-wing dark olive brown. The spots reduced in size and pale ochreous. The band reduced to two quadrate spots in 5 and 6 well separated from the spot in 4. The patch in 2 well separated from the sub-marginal spots in 1b.

" H.-w. basal patch ill-defined, warm ochreous, followed by a dark hind-marginal border which is inwardly inclined to tawny.

" Female fore-wing with brown black ground-colour, spots white and well defined. Hind-wing pale patch well defined and faintly yellow, enclosed by a broad marginal border of tawny brown on which the nervules and rays are well marked."

95c. A. lycoa entebbia. subsp. Pl. XXXII., figs. 3—5, 8 and 11. Pl. XXXIV., figs. 2 and 5.

" Male fore-wing dusky ochreous grey. Spots much reduced in size. Hind-wing ground-colour much as in fore-wing and the pale patch but little developed.

" Female fore-wing ground-colour very dark, white spots smaller and more sharply defined than in *bukoba*. Hind-wing patch small and very faintly yellow."

95d. A. lycoa tirika. subsp. Pl. XXXII., figs. 6, 7, 9, 10. Pl. XXXIV., figs. 3, 4.

" Male resembles *entebbia* but fore-wing ground-colour is olive brown, the pale spots smaller and sharply defined. Hind-wing patch large, pale ochreous, enclosed by a broad dark border of tawny brown.

" Female with very dark fore-wing ground-colour, white spots small and very distinct. Hind-wing patch very small and distinctly yellow."

95e. A. lycoa fallax. subsp.

Male fore-wing nearly black in both sexes. Spots small, white in the female and ochreous in the male. Hind-wing patch rather larger than in the previous forms and sharply defined."

95f. A. lycoa kenia. subsp. Pl. XXXII., fig. 1. Pl. XXXIV., fig. 1.

" Both sexes smaller than in other forms. Ground-colour nearly black. Hind-wing patch slightly indentate between nervules 3 and 4.

Dark areas on underside smoky black. Male with spots and hind-wing patch lemon ochreous. Female hind-wing patch lemon ochreous, fore-wing spots white."

96. ACRÆA JOHNSTONI. Godman. Pl. XXXIII., figs. 1—10. Pl. XXXIV., figs. 6—10.

Expanse 55-62 mm. Variable.

The typical form is as follows: F.-w. apex and margin black, basal two-thirds of wing rufescent or orange tawny, with a slight degree of black scaling at base. Within this orange area are, white or pinkish ochreous spots, one at base of 2; one disto-marginal in 1b; one disto-marginal in 4, and three contiguous in 5, 6, 10, and 11.

H.-w. base suffused with blackish; central area white or ochreous white, produced to an angle in 4 giving to this patch a characteristic shape. Marginal border broadly black, narrowest at 4. Pl. XXXIII., figs. 1 and 2. Pl. XXXIV., figs. 6 and 7.

UNDERSIDE:

F.-w.: dark areas of above are here dull brownish with dark ochreous at apex and marginally; veins and rays blackish. Orange areas dull.

H.-w. base ochreous brown, central areas as above, but duller; marginal border brownish, internally shading to dusky ochreous distally; veins and rays blackish brown. Spots at base as follows: One each in 9, 8, and 7; one in cell, sub-basal sometimes duplicated. Two in 1c; one each basal in 1a and 1b.

FEMALE:

Very like the male but duller and larger. Several varieties occur, some of which have been given names, thus:—

1. Very like the typical form but the apical and marginal black invades the rufescent areas to beyond the distal edges of the pale spots. Apex broadly black. Pl. XXXIII., fig. 4.

2. Like the type form but the hind-marginal border is not clearly defined but diffuse with a consequent reduction in the width of the border. Fig. 3.

3. A form in which the black apical and marginal border of both wings are reduced, the entire wing being tawny yellow, slightly paler in the areas of the fore-wing spots=*f. fulvescens.* Pl. XXXIII., fig. 5 and 6. Pl. XXXIV., fig. 8.

4. In this form the fore and hind-wing are brownish black, the fore-wing spots, and hind-wing patch are ochreous =*f. flavescens.*

5. Very like 4 but fore-wing spots are white =*f. confusa.* Pl. XXXIII., figs. 7, 8 and 10. Pl. XXXIV., fig. 10.

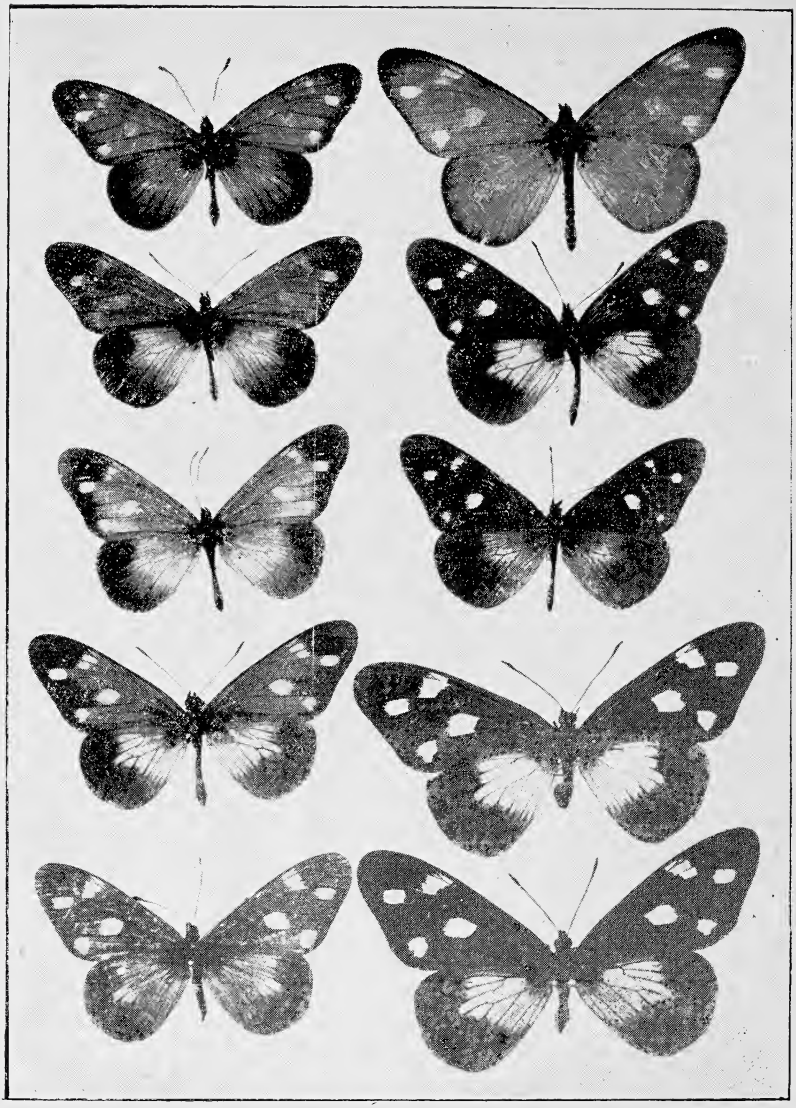

Photo: V. G. L. van Someren.

PL. XXXIII.

Fig. 1. Acræa johnstoni, var.
Fig. 2. Acræa johnstoni, johnstoni.
Fig. 3. Acræa johnstoni, var.
Fig. 4. Acræa johnstoni, var.
Fig. 5. Acræa johnstoni, f. fulvescens, var.
Fig. 6. Acræa johnstoni f. fulvescens.
Fig. 7. Acræa johnstoni f. confusa.
Fig. 8. Acræa johnstoni f. confusa, var.
Fig. 9. Acræa jomhnstoni, var.
Fig. 10. Acræa johnstoni, f confusa

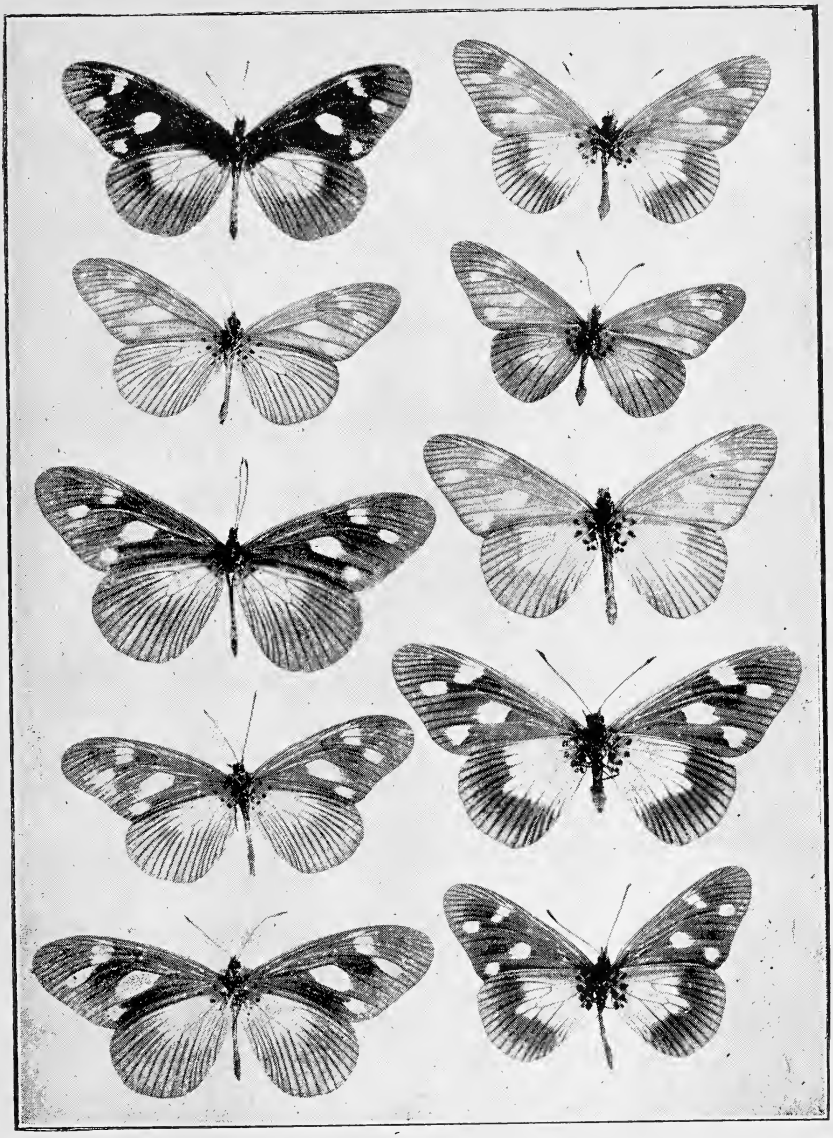

Photo: V. G. L. van Someren.

PL. XXXIV.

Under surfaces.

Fig. 1. Acræ lycoa kenia.
Fig. 2. Acræa lycoa entebbia.
Fig. 3. Acræa lycoa tirika.
Fig. 4. Acræa lycoa tirika.
Fig. 5. Acræa lycoa entebbia.
Fig. 6. Acræa johnstoni.
Fig. 7. Acræa johnstoni, var.
Fig. 8. Acræa johnstoni, f. fulvescens.
Fig. 9. Acræa johnstoni, var.
Fig. 10. Acræa johnstoni, f. confusa.

6. Very like *confusa*, but the hind-wing ochreous patch is heavily dusted with blacker scales so as to give the wing a black appearance. Pl. XXXIII., fig. 8.

7. A large female form in which both fore and hind-wing pale areas are pure white. Pl. XXXIII., fig. 9. Pl. XXXIV., fig. 9.

8. A geographical form has been described under the name of:—

96a. A. johnstoni butleri. Eltr.

This race has the hind-wing patch dark ochreous or pinkish to white; the basal half of the fore-wing purply red and between this and the black apex and margin, an irregular band of tawny yellow which represents an enlargement and a joining up of the pale spots found in other forms.

This race extends into S. Western Uganda to as far as Toro.

Early Stages:

The eggs of this species are like those of *A. esebria* but are more truncate and are laid on the same food plant. The newly emerged larva is blackish brown or olive brown above, with interrupted dorsal and dorso-lateral lines of tawny ochreous. The spiracular line is ochreous outlined below by a broken black line. The spines are long, with fully developed branches. The dorsal and dorso-lateral spines are black, the lateral ones ochreous.

Pupa:

White or ochreous, with narrow black lines on the wing scutæ; black diamond marks on the thorax and black rings containing yellow spots on the dorso-lateral, lateral, and ventral surfaces.

Distribution:

The species extend from the Kilimanjaro and Teita area through the highlands to Mt. Elgon and Uganda, where apparently it appears as a distinct geographical race. The forms described are equally plentiful throughout the distribution of the species except in N. Uganda and most of Busoga; here the forms are limited.

RECENT PUBLICATIONS.

THE GAME BIRDS OF KENYA AND UGANDA.
[By Sir Frederick Jackson, k.c.m.g., etc.]
Williams and Norgate, 1926. Price 25/-

A NATURALIST IN EAST AFRICA.
[By G. D. Carpenter, d.m., etc.]
Clarendon Press, 1926. Price 15/-

The appearance of a book on the Game Birds of Kenya and Uganda, from the pen of Sir Frederick Jackson, is of peculiar interest to the older residents of the Colony and Protectorate, and especially to members of the Natural History Society. It was largely due to the keen enthusiasm and energy of Sir Frederick that the Society came into being, and for many years he held the office of President. We have long looked forward to a book of this sort and the compilation of it has ever been uppermost in Sir Frederick's mind. A book from the pen of the " Father of East African Naturalists " cannot help but be of the greatest interest and value. This volume contains descriptions and notes on the Francolin, Guinea-Fowl, Quail, Sandrouse, Snipe, Duck, Geese, and Pigeons.

As is to be expected, the notes are full of first-hand information regarding habits, etc., gathered together, during many years' residence, by a first class observer. To those of us who have the pleasure of knowing Sir Frederick, as a man and a Naturalist, the book appeals—for it breaths his personality—quiet and unassertive, giving credit where credit is due. To the Sportsman as well as the Naturalist, the book will be useful; it is full of anecdotes of the chase, and gives one an insight into the early days of the Colony. Thus we read: " Currie and self, on the cowcatcher of goods train; stopped train and in about a quarter of an hour to twenty minues bagged eleven and a half brace, lost a few others." Imagine stopping a train in these time-table days

to do a bit of Quail shooting on the way up from Mombasa! Again we read of observations being made from the Secretariat windows, on the call note of Snipe which resorted to a swamp below the said building. Would that these strenuous days were with us once again!

Of criticism we would offer the following. It is to be regretted that the spelling of individual place names have not been corrected so as to correspond; and the selection of English names might have been done with greater care. We note certain omissions not only of geographical races, but species also; thus no mention is made of the Common European Teal and the Wigeon as migrants to Kenya, and the Indian Pin-tail Snipe is ignored; further ,Reichenow's Dove is omitted.

The illustrations might have been improved upon; most are old and have appeared in other publications.

These, however, are minor points which are easy of correction in later issues, and do not really detract from an excellent work. By the publication of this book, Sir Frederick has forestalled a similar work now appearing in parts in this Journal; however, the one should supplement the other, and neither be redundant.

The book by Dr. Carpenter of Uganda, supplies information regarding other branches of Nature not touched upon by Sir Frederick Jackson.

It is really a companion volume to the Doctor's previous work, " A Naturalist on Lake Victoria." As is to be expected, observations on insect-life form the bulk of the subject matter, and at this special subject, Carpenter is first rate. Mimicry and mimetic associations are dealt with at length; but there are also masses of notes on a host of other subjects.

It is a book we can heartily recommend to members of the Society and to the general public. The work is fully illustrated with numerous photographs.